THE

HISTORY

OF THE

WORKS

OF THE

LEARNED.

OR,

An Impartial Account

OF

BOOKS

Lately Printed in all Parts of Europe.

With a Particular RELATION of the

State of Learning

In each COUNTRY.

For the Month of July, 1708.

Done by several Hands.

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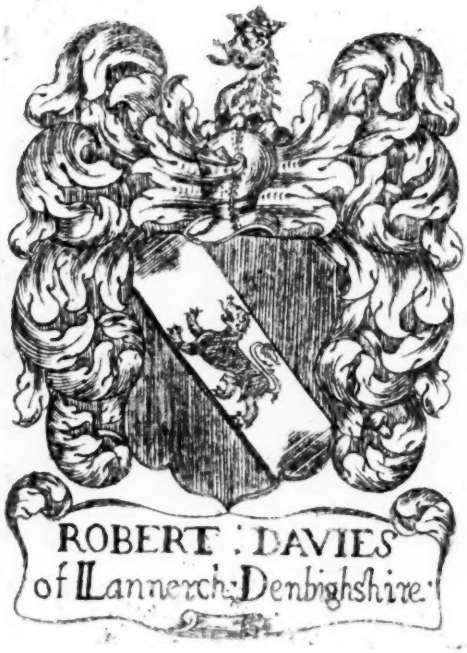
ROBERT : DAVIES
of Llannerch-Denbighshire.

THE HISTORY OF THE Works of the Learned, &c.

For July 1708.

Hiſtoire de l'Academie Royale des Sciences, annee 1707. *Avec les Memoires de Mathematique & de Phyſique pour la meme annee. Tirez des Regiſtres de cette Academie. A Paris* 1708. *in* 40. *p.* 192. *pour l'Hiſt. &* 587. *pour les Mem. i. e.* The Hiſtory of the Royal Academy of Sciences for the Year 1707. With the Mathematical and Phyſical Memoirs for the ſame Year. Extracted from the Regiſters of that Academy. At *Paris* 1708. in 40. p. 192. for the Hiſtory, and 587 for the Memoires.

WE are obliged to the Care of the Abbot *Bignon*, and to the Diligence of M. *de Fontenelle*, for bringing the Hiſtory of the Acacemy of the Sciences to the Terms of the King's Regulation; for that of 1707. was finiſhed the Beginning of *April* laſt, and we ſhall have that of 1708 immediately upon the Concluſion of the Year, and the Hiſtorian being leſs preſs'd for time, we have reaſon to expect it will be done with more exactneſs.

Of Natural Philoſophy in general, we have in this Volume, 1. Some Obſervations of M. *Bernoulli*, and M. *Caſſini* the Son,

upon the Light that proceeds from certain Bodies when rubb'd. 2. Some of M. *Caſſini the* Sons Experiments of Fire Arms differently charg'd. 3. Some of M. *Saulmons*'s Remarks and Reflections upon a ſort of Flint-ſtones commonly called *Galets*, which the Sea caſts up on the Coaſts of *Normandy* and *Picardy*. Thoſe 3 Articles being very ſhort, are followed with the ordinary Article of *ſeveral Obſervations*. There are 2 others which he only mentions, but the Memoirs furniſh us with the Pieces. One is the Journal of M. *de la Hire*'s Obſervations for the Year 1706. Upon the quantity of Rain-water that fell that Year, upon Winds, and upon the different Heights of the Thermometer and Barometer, the other is a curious detail of Obſervations upon Spiders by M. *Homberg*.

'Tis not a late Diſcovery that ſeveral Bodies when rubb'd in the dark give a light, as the back of a Cat rubb'd againſt the hair in Winter, Sugar or Sulphur bruiſed, and ſome other Things. But tho' Chance preſented us with thoſe Phenomena long ago, no Body had hitherto enlarged upon thoſe Obſervations by new Experiments; but much has been done lately as to the new Phoſphorus, for which we are obliged to M. *Bernouilli*, and of which an Account has been already given in the Memoirs of the Academy, and in our Journals. M. *Bernouilli* is one of thoſe who has done moſt on this Subject. Thoſe we have here, tho' but few, are important and Curious: They Treat for moſt part on the Conditions to be obſerved in order to draw Light from Bodies rubb'd one againſt another. Hard Bodies only ſend forth ſuch a light. A great thickneſs however, ſerves inſtead of hardneſs; and M. *Bernouilli* procured light by rubbing Mercury againſt a Plate of Glaſs calcin'd with Tin. Gold rubb'd againſt Glaſs, ſeems to him to be the propereſt of all Metals to produce light, but of all Bodies, the Diamond is that which gives the moſt clear ſhining light, being as bright as that of a burning Coal quickned by Sulphur. M. *Caſſini* the Son, whoſe Experiments are joined here to thoſe of M. *Bernouilli*, obſerved in particular, that a Diamond cut Table ways, had all the effects that a burning Coal have; but the light of a Diamond cut facet-wiſe, had not the ſame livelineſs.

What we have in the Article of Fire-arms differently charg'd, is already well enough known; but being verify'd by Experiments,

ments, ſo exact as thoſe of M. *Caſſini*, they become more certain, which has its own profit.

We come now to the different Obſervations. They are 8 in Number. The 1ſt is of a very ſingular Diſtemper, and a Cure yet more ſingular. 2. Of the Multiplication of little Animals, which a Microſcope diſcovers to us in the leaſt drop of Water, and of their coupling, obſerved by a curious Philoſopher, M. *Carre*'s Friend. 3. Of the Circulation of Blood, which in Inſects eſcaped Mr. *Lewenhoocks* niceſt Obſervations, and was ſeen more diſtinctly in a Spider's Leg with the help of a Microſcope, by the ſame Philoſopher we juſt now ſpoke of. 4. Of a young Man who being in perfect Health did notwithſtanding every Day void by Stool for 4 or 5 Years together a great Number of long Worms of 5 or 6 Lines, tho' he did eat no Fruit nor Sallet, and had made uſe of all known Medicines. 5. Of a Stone of the ſame Colour with the Bezoar-Stone within, but white without, which has the virtue of expelling the Stone in the Reins, and Gravel, and to cure the Strangury, 'tis found in the Body of a ſort of Lizzard common every where in *America*, and call'd *Ignana*; this Lizzard has Two Ventricles, one of which uſually contains this Stone. 6. Of the Cauſes which make the Milk of the *European* Women tranſported to *Batavia* ſo ſalt that their Children will take none of it, ſo that the Negro Women muſt nurſe them, who being brought forth in that Climate have commonly Milk as ſweet as Sugar; M. *Homberg*, who explains this, and was born in that Iſland, was nurſed there by a Black Woman. 7. Of a Northern Light ſeen at *Berlin* between 7 and 8 in the Evening, and which had ſome Likeneſs to that of which M. *Gaſſendi* ſpoke in M. *Peireſc*'s Life, the Phenomenon being communicated to the Abbot *Bignon* by M. *Leibnitz*. 8. Of a new Iſle about Two Miles from that of *Santorini*. Among thoſe Obſervations the firſt and laſt are the moſt curious and ſurpriſing, therefore we ſhall inſiſt upon them a little more particularly.

The firſt is this. A Muſician, whom they do not name, but they tell us he was *famous in his way, and a great Compoſitor*, fell into a continued Fever, and very violent Ravings, accompanied with Cries, Tears, Terror, and continual want of Sleep; the third Day of his raving, by a ſecret Inſtinct, he asked for a little Conſort of Muſick in his Chamber. his Phyſician conſented to it with

with much ado, and they ſung to him M. *Bernier*'s Canto's, as ſoon as he heard the firſt Accords he look'd cheerfully, his Eyes became ſtedfaſt, his Convulſions ceas'd intirely, he wept for Joy, had ſuch an Affection for Muſick as he never had before, and has not now when he is cured; 'twas not this firſt Conſort that totally cur'd him, the Fever return'd as ſoon as it was ended, but they continu'd the uſe of this Remedy, whoſe Succeſs had been ſo unexpected and happy, and the Muſick failed not to produce the ſame Effect, and always ſuſpended the Symptons of the Diſtemper; a Kinſman of his that watched him he would ſometimes make ſing, and dance to him in the Night-time, who being very ſorrowful for his Diſtemper could ſcarce do it: One Night among others having none with him but his Nurſe, who could ſing but one Country Ballad, he obliged her to ſing it, and was eaſed by it; at laſt 10 Days of Muſick cured him intirely, without any other help than that of letting him blood in his Foot, which was the ſecond time he was let blood, and it was followed by a great Evacuation: We cannot doubt the Truth of this Story when we know that it was related by the deceaſed M. *Dodart*, and that he himſelf had carefully enquir'd into all the Particulars.

As to the new Iſle, which is the Subject of the laſt Obſervation, 'twas ſaid at firſt to appear like a little Ship, but grew bigger every Day till it became as great as a tall Ship, that 'tis ſurrounded with ſeveral other Iſles, and that great Flames iſſue from it; that which augments the Surprize in ſo extraordinary a Matter of Fact is, that in the place where this Iſland was formed the Water is 60 Fathom deep. What Force muſt there be in Subterranean Fires to throw ſo high out of the Sea ſuch great Heaps of Stones and huge Rocks?

Mr. *de la Hire*'s Journal for the Year 1706 is done with the uſual Exactneſs of that Academick, we refer the Reader to it, and ſhall only obſerve in general, that there fell that Year only 15 Inches of Water and a little more than 3 Lines, whereas it uſually falls 19 or 20 Inches, that the Cold did not laſt ſo long, and was very moderate, the Thermometer having deſcended only about 20 Degrees and a half, which happened the 21ſt of *January*, and on the contrary the Heat laſted much longer, and was very conſiderable, ſo that the Thermometer was raiſed about

Sixty

Sixty Eight Degrees the 8th of *Auguſt* about the riſing of the Sun, when the Air is coldeſt, and 82 Degrees about 2 in the Afternoon, when the Air is hotteſt, and the Wind South-Weſt, as 'tis uſually in thoſe Countries, becauſe of the nearneſs of the Sea, and was always very violent, tho' that be not uſual there, that the Barometer was raiſed about 28 Inches 1 Line and a half the 10th of *March*, and deſcended the 22d of *December* about 26 Inches 9 Lines; to conclude, on the 31ſt of *December* the Declenſion of the Needle touched with the Loadſtone was found 9 Degrees 48 Minutes towards the Weſt.

M. *Homberg*'s Piece upon Spiders muſt be read with Pleaſure by thoſe who love ſuch Enquiries, 'tis very particular and exact, he reduces all Spiders to 6 Kinds, the firſt is Houſhold Spiders, *i. e.* thoſe which make their Webs upon Walls or in Corners of Apartments, the ſecond is Garden Spiders, who make their Webs in the Air, round, and not cloſe, and hide themſelves in the Center during the Day-time; the third is black Spiders, who ſtay in Caves, or in the Holes of old Walls; the 4th is wandring Spiders, which do not continue ſtill in their Neſt as other Spiders; the 5th is Field Spiders, commonly called Spinners, who have very long Legs, and the 6th is thoſe that our Author calls the mad Spiders, or famous Tarantula's. Mr. *Homberg* at firſt gives us a Deſcription of thoſe Inſects which agrees to all Kinds, and deſcends afterwards to particular Characters which diſtinguiſh each Kind, he chiefly endeavours to ſhew us what cannot well be diſcovered by a ſimple View, without the help of a Microſcope; this Piece is full of curious Particulars, which ſhew that the Obſerver has let nothing eſcape him; what is ſaid there upon the 4 muſculous Nipples that all Spiders have round their Anus, as to the uſe of thoſe Parts, and particularly the Number and different Diſpoſition of the Eyes of thoſe Inſects, ſeems to us to be new, as well as an infinite Number of other Particulars that are worth the knowing; all Spiders have 8 Eyes, except thoſe found in Cellars, which ſeemed to Mr. *Homberg* to have only 6, but thoſe Eyes are found differently diſpoſed in each Kind, and 'tis from this different Diſpoſition of the Eyes M. *Homberg* forms the chief of the particular Characters that diſtinguiſh Spiders; the way how thoſe in Gardens make their Webs is admirable, but we cannot inſiſt upon it, one ſhort Remark however we cannot paſs over, which is, that neither the Spirit of Wine poured

ed upon this kind of Spiders, nor Strong-water, nor Oil of Vitriol, can do them any Harm, but the Oil of Turpentine kills them in a Moment. Another Remark that relates to all Kinds of 'em, and with which we ſhall finiſh this Article, is, that the young ones as ſoon as they are brought forth grow big in the Twinkling of an Eye, even without taking Food, at leaſt ſo far as can be perceived, ſo that in 2 Days time they grow twice as big as they were at firſt.

Anatomy preſents us with a great Number of Enquiries, as to what becomes of the Air which enters into our Lungs, this is a Piece of Mr. *Mery*'s, in which he anſwers the Objections publiſhed againſt his Syſtem; what is ſaid of the *Glandula Pituitaria*, 'tis an exact Deſcription and a learned Explication of its Uſes, by M. *Littre*. *That about the Formation of the Voice*, is a new Supplement of the deceaſed M. *Dodart* to what we have already from him concerning this Subject, which he enriches with new Diſcoveries. *As to the Dropſy of the Peritonæum*, 'tis an Obſervation of M. *Littre*, very large and accurate, on occaſion of a Lady that died of this Diſtemper, and whoſe Corps was opened. *As to thoſe on the Cataracts of the Eyes*, one of 'em is M. *Mery*'s, and the other by M. *de la Hire* the Sons, in which thoſe Two Academicks prove equally by peremptory Matters of Fact that the Cataract and the Glaucoma are Two very different Diſtempers of the Eyes; we have on all thoſe Articles both the Memoirs of the Authors and the Diſcourſes of the Hiſtorian.

The Uſe that this Author aſſigns to the *Glandula Pituitaria* is not only to receive the Lympha that the Tunnel ſends into it, after it has been filtrated by the membranous and very fine Glands of the *Plexus Choroides*, but alſo to make Filtrations by its ſelf, and to ſeparate from the Blood a white, very ſubtil and ſpirituous Liquor; we ſhall not enter further into the Detail, but obſerve with the Hiſtorian the Particularity of the Situation of this Gland in the Brain, 2 of the Sinus which touch it, *viz.* 2 of thoſe Reſervatories in which the Blood of different Veins meet in order to return to the Heart are exactly opened in the place where they touch it, ſo that part of it is dipped in the Blood, which M. *Littre* thinks to be a kind of a *Balneum Mariæ*, that preſerves a neceſſary Heat in the Gland for performing its Functions.

The

The greateſt part of what we have here of M. *Dodart*'s upon the Voice and Tones relates to a Subject which ſeems inconſiderable when not conſidered Philoſophically, 'tis the way of whiſtling; Mr. *Dodart* on this Occaſion quotes very pertinently that excellent Saying of *Ariſtotle*, *That 'tis Childiſhneſs to look with Contempt and Diſdain upon little Things, from which we may draw great Conſequences.* Nothing more juſtifies that ancient Philoſopher's Opinion than this ſame Piece of our modern Philoſopher; we cannot eaſily imagine how a Matter in appearance ſo inconſiderable as that of a Man's Whiſtling has furniſhed M. *Dodart* with ſo many excellent Things; he had aſſerted, that that which forms the Voice is, that the Head of the Mouth of the Windpipe contracts it ſelf, and binds up its Lips, ſo that the Wind iſſuing with more Swiftneſs by this narrow Paſſage makes a noiſe by the way, and occaſions Vibrations, and that the Tones are formed by the different Degrees of opening the Windpipe, he had brought very ſtrong Proofs for it, but the way of Mens Whiſtling gives him an opportunity to preſent the thing to our Eyes; he ſhews us in the opening of our Lips when we whiſtle a viſible Head of a Windpipe, which acts juſt as the Windpipe properly ſo called; that Opening, which is naturally wide enough for us to blow or breath thro', is conſiderably ſtraitened when we whiſtle, and ſo much the more, the higher the Tones are: Thoſe who can whiſtle without moving their Lips do only put againſt the Palate of their Mouth the 2 ſides of the Point or End of their Tongue, ſo that they leave between that Point and the Palate of their Mouth an opening, thro' which the Air paſſes quickly, and as it is more or leſs ſtraitened it gives different Tones, this is a third ſort of a Windpipe; we cannot enlarge farther, but dare aſſure the Readers who underſtand Natural Philoſophy that this Piece is worth their Curioſity, and that the ſenſible Inſtances of Two new Windpipes demonſtrate all that Mr. *Dodart* has advanced as to the true Windpipe.

The Dropſy of the *Peritonæum* is a Caſe ſo ſingular, that the Singularity of it muſt give a Value to M. *Littre*'s Obſervation. To form this Dropſy ſome Cauſe muſt divide that Membrane according to its Thickneſs, and make it become thereby a particular Bag, fit to contain the Water that is poured into it; M. *Littre* explains in a very reaſonable manner the Syſtem he has formed upon this Subject, and does Juſtice to one of his Fellow Mem-

bers by informing the Publick, that as ſingular as it is he foretold it in the Lady juſt now mentioned, who died of it at the end of four Years; he gives us the Hiſtory of it, with the Symptoms that attend it, by which we may know it, and at laſt propoſes the Means of curing it.

We have ſo often ſpoken of Cataracts and Glaucoma's already in the Hiſtories of the Academy and Journals, that it would be tedious to make a long Article of it here, we ſhall content our ſelves to relate after M. *Mery* a Matter of Fact and an Inſtance of Practice, the one being demonſtrative of the common Opinion which diſtinguiſhes a Cataract from the Glaucoma, and the other very uſeful in Operations, for cutting either the Cataract or Glaucoma: The Matter of Fact is, That M. *Littre* ſhewed the Academy of Sciences the Eye of a Man of 22 Years of Age, where he had a Cataract, or little Skin, which intirely ſhut the opening of the Apple of the Eye, that little Skin was ſmall, ſomewhat dark, and fixed to the whole interior Circumference of the Circle that ſurrounds the Ball of the Eye, within a third of a Line of the Edge of the Apple of the Eye, and a Line and half of the Cryſtalline, which was in its natural State; that was the Matter of Fact, the Inſtance of Practice or of an Operation follows. An able Surgeon being about to take a Cryſtalline really Glaucomatick out of a Man's Eye, which looked as if it had been plaſtered over, he made an Inciſion in the horny Tunicle, which traverſed it almoſt intirely, and thereby drew out the Cryſtalline with good Succeſs; the horny Tunicle being cut eaſily heals, and the watry Humour is repaired with the ſame Facility: That Operation and the Succeſs of it makes M. *Mery* believe that Cataracts may be drawn out by an Inciſion made in the horny Tunicle, and that this Method, from which there's no Danger to be apprehended, would prevent all the Inconveniences of the ordinary Operation; 'tis certain that the Cataract would not riſe up again, and cauſe ſuch Inflamations as it may occaſion when 'tis Couch'd by force to the bottom of the Eye; for the better avoiding of Deformity the horny Tunicle ought to be cut at the bottom, and not over-againſt the Apple of the Eye.

The ſeveral Anatomical Obſervations contain only four Matters of Fact; that a Dog became Mad by eating Blood from one that labour'd under a Hydrophobia. 2d. That in a Child of four

four years of Age, after its death, Mr. *Littre* found no ſign of its left Rein, nor of the Artery on the ſame ſide. The right Rein was no greater, and the Bladder leſs than uſual. 3d. The Pulmonary Artery of a Man full of Stony Knobs, that M. *Chomel* ſhow'd to the Academy of Sciences. 4th. A prodigious Dilatation of the *Ovarium* of a Maid at *Marſeilles* of 26 years of Age, who died of it: The Relation of this extraordinary and unknown Diſtemper is long and very particular.

The Vitrification of Gold, the Vegetation of Iron, Mead that taſted like Wine, the eſſential Oyls of Plants, and the different Colours they take by their different mixtures; different Vitriols, and particularly Ink made with Vitriol, and the nature of Iron, are ſo many Articles of Chymiſtry touched in the Hiſtory.

We have beſides, in the Memoirs M. *Lemery*'s Obſervations upon Cows Piſs, and the Anatomy of the Waters of *Viſhi* and *Bourbon*, by M. *Burlet*.

What relates to the Vitrification of Gold is by M. *Homberg*. He anſwers ſome Objections and Inſtances againſt his Opinion in this Point, which he confirmed in the Memoirs of 1702. When Gold is expos'd to a Burning-glaſs, part of it goes into Smoke. M. *Homberg* ſays, that 'tis the Mercury which is in the Compoſition of the Gold. Another part is vitrified, which he thinks to be the Earth penetrated by its Sulphurs.

The ſubſtance of his Syſtem which is combated, is this;

The Matters preſented to the *Focus* of a Burning-glaſs, are brought upon a Coal; the great heat about the *Focus* reduces ſome particles of this Coal into Aſhes, which fly upon the expoſed Matter. He tells us, that a Philoſopher who was witneſs to M. *Homberg*'s Experiments, thought that it might be its Aſhes which were vitrify'd upon the melted Gold, and not a part of the Gold. That's the Objection. M. *Homberg* anſwers, that if thoſe Aſhes were vitrify'd upon the Gold, they ought alſo to be vitrify'd upon Silver melted by the *Focus*, which is not ſo, ſince no Vitrification is made. The Philoſopher inſiſts and pretends, that we muſt not only conſider the direct Rays of the *Focus*, but alſo the Rays reflected by the melted Metal, and that

Gold reflecting more Rays than Silver, the Aſhes which are not vitrify'd upon the Silver may be vitrify'd upon the Gold, where the reflected Beams being more numerous, have alſo more force. To which there are three Anſwers; 1. The Action of the reflected Beams cannot be reckon'd as nothing, with relation to the Action of direct Beams, the firſt having ſo much the leſs force, becauſe they cannot reflect but by ſeparating one from another, becauſe of the Spherical Figure the melted Metal takes. 2. 'Tis not perceiv'd that Gold reflects more Beams than Silver, and if there be any difference 'tis inconſiderable. 3. When a Coal is expos'd to a Burning glaſs, its Aſhes are vitrified in an inſtant by the direct Beams; then if they were the Aſhes of the Coals which are vitrified upon melted Gold, they would be vitrified alſo upon Silver by the direct Rays only, without the help of reflected Rays.

The Article of the Vegetation of Iron is one of the moſt Curious. M. *Lemery* the Son promis'd it as a Supplement to his excellent Piece upon the Iron of Plants in the Memoirs of 1706. Tho' the Inquiries were not then upon the Vegetations of Metals, yet they produc'd the Chymical Vegetation which he gave us under the name of *the Tree of Mars*: But he ſpoke only occaſionally of an Experiment ſo new and ſo happy; and not willing to looſe the principal Subject he treated of, he did not enlarge upon what he had obſerv'd by repeating often and by different ways the ſame Obſervation. He gives us now with advantage what his firſt Deſign did not permit him to give ſooner; and we have here a near, coherent, exact and compleat Detail of Phyſical Experiments and Reaſons upon the Vegetations of Iron, for which we refer to the Book it ſelf.

M. *Lemery* the Eather's Mead ſo exactly reſembles *Spaniſh* Wine that it might ſerve inſtead of it in Countries that want Wine. We know that Mead is made of Hony temper'd with a ſufficient quantity of Water, and fermented by a long and gentle Heat. M. *Lemery* explains here all the whole ſecret of this Preparation, and his exactneſs makes him deſcend to the meaneſt Circumſtances. Mead is of little uſe in Phyſick; ſo that to ſpeak with the Hiſtorian, this Inquiry is not ſo profitable as pleaſant; but Pleaſure alone is not unworthy the Obſervation of Philoſophers.

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The Author of the Memoir upon eſſential Oyls, and the different Colours they take becauſe of their different Mixtures is M. *Geoffry*, Jun. who, tho' but young, has already made a conſiderable progreſs in Chymiſtry, and follows the footſteps of his Learned Brother. The Academy, ſays he, has found by more than 1400 Analyſes, that from all Plants there's extracted only Subſtances of the ſame kind, and often ſuch that in this reſpect there is no difference between a Pot-herb and a venomous Plant. M. *Goeffry* being perſwaded, without doubt, that we ought not to be over Credulous, that it is a Maxim which equally agrees to thoſe who ſearch for the Truth, and thoſe who look only for Riches, he hop'd by his Labour to diſcover the ſenſible differences between like Subſtances taken from different Plants. Salt having been very much ſtudied by Chymiſts, he has apply'd himſelf to eſſential Oyls, which he thought was leſs known or uſed; he left the way of Analyſes, of which he expected no Succeſs, and determined to make ſome mixtures of thoſe Oyls with different Matters, and to obſerve their Effects. That to which he has moſt apply'd himſelf hitherto, and is really the firſt thing that offers, is the change of Colours. His Obſervations tend to prove, that the Colours ariſe from different mixtures of Oyls and Salts; but they are as yet too imperfect to found a Syſtem upon them. He has only found hitherto that the Oyl of Thyme among Vegetables, and that of yellow Amber among Minerals, by different Salts took different Colours: Yet, ſays our Hiſtorian, to ſatisfie in part, a certain natural Impatience, we may believe from the Experiments of M. *Geoffy*, that Oyls take a ſort of a red Orange Colour by predomining Acids, and all the reſt, from a red fleſhy Colour to purple and violet, proceed from a volatil urinal ſalt Alkali. M. *Geoffry* carries his Conjectures yet further, and tho' we dare not affirm that Experience always confirms them, it diſcovers however a penetrating Genius capable to form fine Ideas.

M. *Lemery*, the Son, made the Obſervations upon *different Vitriols, and particularly upon Ink made with Vitriol*, which tho' it be a thing very common, we ſhould be much miſtaken if we think there's nothing Curious here: The Queſtion at firſt is of ordinary Ink, but we ſhall find afterwards that his Speculation

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is raiſed, and that our Author's Syſtem upon the Tree of Mars is confirmed and maintained by new Experiments.

What we have here upon the nature of Iron conſiſts of two Pieces which have a relation to one another: The firſt is by M. *Lemery* the Son, and the ſecond by M. *Geoffry* the elder. They were compoſed upon the occaſion of the Controverſie betwixt them, as to the artificial Generation of Iron. M. *Lemery* pretends to ſhew by new Experiments upon Oyls, and ſome other Matters, where no Body had hitherto thought of ſearching for Iron, that there is Iron in what M. *Geoffry* uſes and mixes together for the Production of his Artificial Iron, which makes this Production ſuſpected. As to M. *Geoffry*, in his Explication, he owns that there are ſome Particles of Iron in the Matters he uſes: But he endeavours to prove by many Experiments, that the quantity of it is ſo ſmall that it bears no proportion to what he makes by the mixture of thoſe Matters. There are excellent Obſervations in M. *Geoffry*'s Memoir, which have no relation to this Controverſie, but are very much contrary to M. *Homberg*'s Syſtem upon the nature of Gold. To conclude, it is an advantage to the Publick, that there are Controverſies betwixt thoſe Learned Gentlemen, who contend only for Truth, and give true marks of a mutual Eſteem from one another. Thoſe Diſputes being of ſuch a nature as without dividing their Affections, animate them to make new Diſcoveries, and produce an infinite number of good things.

All things are ſubject to Faſhion, Medicines not excepted. The uſe of Cows Milk is grown out of date, and that of Cows Piſs which is drunk now under the fine name of the Water of Milleflowers. The *Germans* have uſed this Medicine a long time; the Phyſicians of *Strasburg* have brought it into Vogue within theſe few Years, and the *French* had it from them. M. *Lemery* the Father ſhews us in his Memoir the Nature and Effects of it, what Conſtitutions and Diſtempers it ſuits, in what ſeaſon of the Year, and with what Precautions we muſt take it. He has preſcrib'd it to diverſe Perſons, and on ſeveral Occaſions, always almoſt with Succeſs, and generally without any ill Conſequences. He ſpeaks only of his own Experiments, and relates ſeveral of 'em here, with all their favourable and diſadvantageous Circumſtances. The great number he has made of them

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has enabled him to judge more ſurely of the quality of this Medicine, ſo that he believes it a very good Medicine that ought not to be neglected.

Thoſe to whom Cows Piſs may do good, but drink it with reluctancy, notwithſtanding its charming Name of the Waters of 1000 Flowers, will be very well pleas'd to hear that the diſagreable Taſte of it may be taken away. M. *Geoffry* tells us he has diſtill'd it, and that makes it white, clear, and of a very ſweet ſmell.

We muſt refer the other Articles to another Opportunity.

Franciſci Redi de Animalculis vivis, quæ in Corporibus Animalium vivorum reperiuntur, obſervationes. Ex Etruſcis Latinas fecit Petrus Coſte. Amſtelodami 1708. i. e. *Francis Redi*'s Obſervations on little living Animals found in the Body of other living Animals. Tranſlated from *Italian* into *Latin* by M. *Coſte*. At *Amſterdam* 1708. in 12 p. 342.

THE whole Terreſtrial Globe may in ſome ſenſe be ſaid to be animated, ſince every where there is found a prodigious number of Animals, great or ſmall, viſible or inviſible. There are ſome of them in the Air, in the Water, in the Earth, in the hardeſt Stones. There are a great many in all Plants; there is not, perhaps any Animal but what nouriſhes others in ſeveral parts of its Body, and who knows but thoſe little Animals, almoſt imperceptible, have other little Animals to whom they give Life and Nouriſhment, in proportion to what they themſelves are with relation to the Animals who nouriſh them? Nay, ſince Matter is diviſible in *infinitum*, we may puſh the Matter in *infinitum*, or at leaſt ſo far till the ſtrongeſt Imagination looſes it ſelf, and thoſe Animals thus put into one another ſucceſſively, as little Boxes are into greater, may eſcape the niceſt penetration.

This Thought may ſerve to produce in us great Ideas of the infinite Power of God, and of his perfect Wiſdom, which created

ted all Beings, gives each of them a place agreeable to their Nature, provides them with Food neceſſary for their Maintenance, and proper means for the preſervation of their Species.

Mr. *Redi*'s Book is very proper to produce ſuch Thoughts, and the Publick is oblig'd to Mr. *Coſte*, who has Tranſlated it into a Language more generally underſtood than the *Italian*. It had been well if Mr. *Redi* had obſerved a better Order in explaining the diſcoveries of his Experiments, and that he had divided his Book into Chapters; but that's a Fault common enough to all thoſe who neglect the ſtudy of good Logick, and very much hinders the progreſs of Sciences. This is only part of a Work which Mr. *Redi* mentions in this Volume. Mr. *Coſte* ſays, he has not ſeen it, and knows not if it be publiſh'd; but if it be, he will not fail to tranſlate it as ſoon as it comes to his Hands.

To give a juſt Idea of this little Work, we ſhall tranſlate the Extract publiſhed at the beginning of it, and add ſome of the moſt conſiderable Remarks.

Mr. *Redi* gives us firſt the Anatomy of a Serpent with two Heads, that the Inhabitants of *Piſa* call an Aſp; and becauſe he wou'd try whether its Stings were venomous, he ſhews us the Experiments he made upon the Sting of Vipers after their Death, and the effect of Sticks infected with their Venom.

Afterwards, upon the occaſion of Worms found in the Entrails of that Serpent, he gives us a Diſſertation upon Earth-Worms, and thoſe found in ſeveral living Animals which he anatomiz'd: And, to confirm what he advances, that the parts for Propagation are perfectly the ſame in Male and Female Earth-Worms, he alledges the inſtance of Snails of both Sexes, which he had diſſected, in whom he found the ſame thing. He maintains againſt Father *Buonanni*, that Snails and other little Animals have a Heart, and examines the Experiments which this Learned Man had related, to prove that thoſe Inſects are produc'd of Corruption; for our Author is of their Opinion who maintain that all Animals are produc'd by Generation properly ſo called.

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He explains afterwards why Inſects cleave to certain peculiar Flowers, and ſhews that there are Animals who at certain times of the Year change their Abode to lay their Eggs. This is follow'd by a Journal of Obſervations he made as to the Generation of Inſects upon certain Flowers and Herbs.

He returns afterwards to his Remarks upon Worms, Leeches and other Animals. He examins if thoſe who devour Stones are nouriſh'd by them. He gives ſome Experiments to know how long certain Animals can live without Food.

He returns again to the Entrails of Earth-Worms, after which he relates ſeveral Experiments as to the moſt proper Materials to kill thoſe Inſects, and ſuch as are ingendred in the Body of Man.

He gives afterwards a long account of Worms found in ſeveral Animals. He informs us how long Tortoiſes may live without a Brain, and even without a Head. He returns again to Worms found in Animals, and continues his Account to the end of his Book. This Analyſis of his Method proves what I ſaid before, that Mr. *Redi* does not obſerve a very exact Order. Some of his Remarks are as follow;

1. It appears from the many Experiments Mr. *Redi* has made, that the venom of Vipers does not conſiſt, as ſome have thought, in certain inviſible Spirits, that they ſpread into the Wounds of thoſe they ſting when they are anger'd; but in the yellowiſh Water that they have in their Gums which runs into the Wound they make. One of his Experiments is thus; Mr. *Redi* took ſome litte pointed Sticks which he dipp'd ſeveral times into that Liquor, and let them be dry before he had dy'd them again. He put them into Glaſs Bottles well ſtopp'd. A Month, nay forty Days after, he wounded ſeveral Pigeons and Chickens with thoſe Sticks in the fleſhy part of their Breaſts, and all of them died a little time after; and he made the like Wounds in other Pigeons and Chickens with little Sticks, which were not infected with the Vipers, and none of 'em died.

2. There is found in the Neck of Snails a kind of Bone, or very white Stone, ſometimes rough and ſometimes ſmooth. Thoſe Stones are very different in bigneſs and weight, Mr. *Redi* found the leaſt to weigh two or three Grains, and the biggeſt nine or ten. Ancient and Modern Authors have ſpoken of the wonderful Effects of this Stone; but our Author thinks that at fartheſt their Vertue does not exceed that of Pearls, Stones of Lobſters, and Shells of ſeveral Fiſhes of the Sea: So that he does not think it worth while to gather thoſe Stones, of which we cannot have any quantity without a great deal of trouble ſince we can have as effectual Remedies more eaſily.

3. Mr. *Redi* affirms againſt Father *Buonanni*, as we have already hinted, that Earth Snails have a Heart, which may eaſily be perceived without a Miroſcope; for by our Eye we may ſee the Motions and Beatings of their Heart at ſet times. Not only thoſe Inſects have Hearts, but Nature has alſo given them to Oyſters of all ſorts, and to all other ſorts of Shell Fiſh, whether in the Sea or freſh Water, and, in a word, to all Animals, tho' they have not red Blood, for 'tis not neceſſary that all Blood ſhould have that Colour, no more than 'tis neceſſary that all Wine be red. 'Tis the ſame with all ſorts of Worms, even thoſe that to us ſeem moſt Contemptible, and 'tis the like with all thoſe Animals, which we find faſten'd to Rocks.

Beſides, we find Inſects which in this reſpect ſeem to have a better ſhare than the moſt perfect Animals, ſince inſtead of one Heart they have ſeveral. Our Author reckons twenty among Earth-Worms. This is a Remark which the famous *Malpighi* had made before in his Treatiſe of the Silk-worm.

4. Our Author ſays he found by ſeveral Experiments, that every Year, towards *Auguſt* when the Rains fall, in very dark Nights, Eels go in great Companies from Lakes and Rivers to the Sea, where they lay their Eggs, and when they have done ſo, they return to the Rivers by their Mouths, ſooner or later, according as the Cold is greater or leſs, which is uſually about the end of *January*, or a little after the beginning of *February*, and continues frequently to the end of *April*.

5. It

5. It follows from the Experiments Mr. *Redi* has made as to Inſects to prove, that they are all produc'd by Generation properly ſo called, that if any of them be produc'd from bruiſed Flowers 'tis becauſe ſuch Anima's have laid their Eggs on them; if ſome Worms be produc'd upon certain Flowers, and others upon others, 'tis becauſe all ſorts of Flowers are not proper to nouriſh all ſorts of Inſects. Thoſe little Animals being allur'd thither by the ſmell of thoſe Flowers, they lay their Eggs upon ſuch of them where their little ones may find Nouriſhment till they be big enough to go elſewhere. 'Tis an Opinion now ſo well confirmed, that no Animal is produc'd of Corruption; that there is no neceſſity of the new proofs for it which Mr. *Redi* has quoted in this Book, yet the Journal of Experiments which he has made in this reſpect are very Curious.

The Entrails of all Earth-worms are always full of a kind of very fine and impalpable duſt of Earth, which is the only Nouriſhment they make uſe of, for they taſte no Roots, nor Herbs, nor any Fruits of the Earth, ſo that 'tis not without Reaſon that *Plautus* ſays in one of his Comedies,

Poſt autem niſi ruri ervum tu comederis,
Aut, quaſi Lumbricus, Terram.

'Tis not only Earth-worms that feed upon Earth; our Author has obſerv'd, that we many times find the long Entrails of Inſects that creep in the bottom of the Sea, called *Priapi Marini*, filled with very ſmall Sand. He has alſo obſerv'd, that the Stomach of Coots, a Water Fowl, is always full of little white Stones, ſomewhat bigger than Grains of Sand, among which we find ſometimes ſhreads of Herbs, or Leaves.

Yet Mr. *Redi* does not think thoſe Fowls feed upon ſuch Stones, and the Reaſon he gives for it is this: In the Spring he ſhut up a Capon, without giving it either Meat or Drink, and it died in 5 Days; other Capons ſhut up after the ſame manner died on the 7th, 8th or 9th Day; he found in the Stomach of all thoſe Capons a great many little Stones, which they had ſwallowed before they were put up, and notwithſtanding the

great need they had of Food all that Time they were neither conſumed nor changed into Nouriſhment.

He made the ſame Experiment upon another Capon, to which he gave as much Drink as it would, beſides a certain Number of little Stones, that it might ſwallow them when hungry, but it touch'd not one of 'em; ſeveral Days after it was ſhut up it drank often, and in great Quantities, but four Days before it died did not drink ſo frequently, and died the 20th. Another Capon ſhut up after the ſame manner, and having drank as much as it would died the 24th Day; Mr. *Redi* found in their Stomachs Stones like thoſe he found in the firſt. He made the like Experiments on Pidgeons, and other Fowls, but it would be too tedious to relate them all, we ſhall only obſerve that he found the Entrails of the Animals that died for Hunger perfectly clean, from whence he concludes that Faſting is the beſt Remedy for purging Mens Entrails.

7. Our Author has made a great many Experiments, that he might know what was moſt proper to kill Worms, in order to prevent the Diſeaſes in Human Bodies occaſioned by them, ſome of his Obſervations are as follow.

He found that Oil was not a very certain Remedy to kill 'em Among other Experiments he anointed carefully four Worms with Oil of Olive, after which he ſhut them up in a Glaſs Bottle with Earth which they uſed to feed upon, and they continued alive 15 Days, he caſt Two of 'em which were very thick into Two Veſſels full of Oil, and they continued alive Twenty Four Hours, tho' they ſeemed very ſtiff, he took them afterwards out of the Oil, and put them in a Veſſel full of moiſt Earth, one of 'em died the third Day, the other liv'd to the 6th, tho' it appeared very ſtiff, and to have little Life; hence our Author concludes, that tho' Oil be hurtful to Worms, yet it is not the quickeſt Medicine that may be uſed to kill them, tho' it kills very quickly a great many other Inſects, ſuch as Flies, Waſps, Bees, Scorpions, Crickets, Moles, Snails, Silk-Worms, All ſorts of Caterpillars, *&c.* Nor are Treacle, Orvietan, and Mithridate, more certain Medicines to kill Worms. 'Tis true, if we cover them with thoſe Medicines mix'd with Wine, the Worms would die in it; but which way ſhall we make Infants

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ſwallow ſo great a quantity of 'em, as entirely to cover the Worms they have in their Body. Beſides, ſo great a quantity of theſe Medicines would do more hurt than the killing of 3 or 4 Worms by them would do good; ſo that 'tis not fit to torment Children by making them take Medicines ſo unpleaſant to 'em, and at the ſame time ſo unprofitable. If Treacle kills Worms, 'tis only becauſe of the Honey which is in the Compoſition, and of two other Electuaries, which our Author mentions afterwards. He alſo put Worms into a very ſtrong Tincture of Aloes, which ſhews that this Simple is not ſo ready and ſure a Medicine to kill thoſe Inſects, as 'tis commonly thought to be. The Grain called *Semen Sanctum*, kills Worms in the Space of 7 hours; ſo that 'tis uſed with good Reaſon for that End. Very big Worms dy'd in leſs than half an hour, in 6 Ounces of common Water, in which was diſſolved half an Ounce of powder'd Pepper. Our Author having rubb'd the inner Surface of an earthen Veſſel with Garlick, and leaving at bottom the Cloves of Garlick, with which he rubb'd it, he put 6 Worms into it, 3 great, and 3 little ones, which appear'd at firſt to be ſtaunch with the Smell and touch of the Garlick. He covered them afterwards with Earth, that they might feed upon it, and mix'd it with ſome Cloves of Garlick cut very ſmall. All theſe Worms liv'd in it 20 Days together, and would have liv'd longer if our Author had left them there.

Mr. *Redi* diſſolv'd Spaniſh Honey into a little quantity of common Water, and put 4 Worms in it, which all died in the ſpace of 20 Minutes; he often repeated this Experiment, and always with the ſame Succeſs; he concludes from hence that 'tis without Reaſon People pretend that ſweet Things produce and maintain Worms; 'tis better, ſays he, to give Children Honey diſſolved in Water, which they may drink with Pleaſure, than all thoſe other unpleaſant Potions that Phyſicians preſcribe them. Worms die alſo in ſugar'd Water, but not ſo quickly, *i. e.* in the ſpace of Two Hours; Sugar is ſuch an Enemy to Worms, that if you put one into a Glaſs Bottle and cover it with fine pouder'd Sugar ſo as it may roul upon it, you will ſee it die in a few Moments; ſalt Water produces the ſame Effect; and according to the different Salts Worms die ſooner or later. Water wherein Mercury is ſteepeed is alſo a very good Remedy againſt Worms, but Brandy is beſt of all, ſince Worms die the very Moment they are cait into it; they alſo die very quickly

in Orange-Flower Water, Roſe-water, Mirtle-Flower Water, or when they are covered with Tobacco-Duſt. People commonly believe, and ſeveral Authors have writ ſo, that Water diſtilled from Worms makes them die quickly, but Mr. *Redi* has obſerved that they lived in it ſeveral Days.

It may be objected, that all his Experiments were made upon Earth-worms, but it cannot be concluded that what he has proved as to thoſe Worms will hold true as to thoſe in Human Bodies, which may be of another nature; he anſwers, that 'tis very hard to make ſuch Experiments upon Worms that are in Human Bodies, for we can ſeldom have them alive, and when we have 'em 'tis uncertain if they die becauſe they are out of the place where they were accuſtomed to live, or whether they die neceſſarily after a certain Time, or by force of the Means uſed to kill them; it muſt be granted that this Objection puzzles other Phyſicians as to ſeveral Experiments they have related as well as Mr. *Redi*, yet he relates ſome which prove that what he has ſaid of Earth-Worms agrees likewiſe to the Worms of Animals; he has experienced, for Inſtance, that the Worms of Human Bodies die in 3 or 4 Hours time if they be caſt into cold Water in which Sugar has been diſſolved in ſuch a quantity as to make it a kind of Julep.

8 The Experiments our Author has made upon Land Tortoiſes are very curious. In the beginning of *November* he made a Hole in one of thoſe Tortoiſes Sculls, he took the whole Brain out, without ſtopping the Hole, and let the Tortoiſe go, which it did as freely as if it had received no Harm, but groping along, becauſe as ſoon as its Brains were taken out it ſhut its Eyes, and opened them no more; in 3 Days time the Hole which was made in its Scull was covered with new Fleſh, and the Animal went about very freely, and lived to the middle of *May*, *i. e.* 6 whole Months; after it died Mr. *Redi* opened the Cavity he made in the Brain, he found it clean, ſmooth, and empty, ſave a little drop of black and dry Blood; he renewed his Experiment on other Tortoiſes, and they ſucceeded much after the ſame manner, only ſome of 'em tho' they liv'd did not move from the place: There is this which is ſtill more, he was advertized by a Gentleman belonging to the great Duke of *Florence*'s Court, that Tortoiſes will live without a Head for ſeveral Days, to try the

the Truth of this he took a great Tortoiſe, cut off its Head, and drew as much as he could of the Blood from the cut Veins, which was cold, but very red; the Tortoiſe lived 23 Days without its Head, he knew it was alive thus, becauſe when he prick'd its Feet before or behind it drew them away immediately; having made the ſame Experiment upon Two other Tortoiſes he diſſected them 30 Days after, and found the Heart panting and living, the reſt of the Blood entred into the Heart, and came out of it, as uſual, it reſembled Water in which bloody Fleſh is waſhed.

9. Our Author ſhews that *Cardan* is miſtaken, when he thought that in Eels there are not found Bladders full of Air, which are found in all other Fiſhes; we have here an Account of the Fiſhes in which Mr. *Redi* found them, and of thoſe in which he did not; in ſome Fiſhes thoſe Bladders are divided into 2, as in Carps, where they are ſo viſible, and in others into 3. Mr *Walter Needham* in his Treatiſe of the *Fœtus formed* alledges, That all Fiſhes which have Teeth in their Jaws have only one ſuch Bladder, and that Fiſhes which have not Teeth in their Jaws have 2, or, which is all one, this Bladder is divided into 2 Cells; but Mr. *Redi* maintains, That there are Fiſhes which have Teeth, and yet have a Bladder with 2 Cells, and the Shad-fiſh on the contrary has only one Cavity, tho' it has no Teeth.

10. Generally ſpeaking Fiſhes have very little Brains in Proportion to their Bignels; *Stenon* relates that the Brain of a Sea Dog of 3000 Pound Weight and more weighed only 3 Ounces; Mr. *Redi* found that the Brain of a Sea Tortoiſe of 69 Pound weighed only the 6th part of an Ounce, that that of a Sea Fox of 28 Pound weighed only the fourth part of an Ounce, and which is more ſurpriſing, a Tunny, which, after it had been gutted, weighed 380 Pound, had a Brain which weighed little more than the eighth part of an Ounce, and the Brain of another Tunny of 342 Pound after being gutted did not weigh ſo much. Our Author ſays he dare be poſitive that of all Beaſts of what kind ſoever there is none whole Brains weigh more, in Proportion to the Body, than that of the Dolphin. The Brains of Oxen and Butalos, which weigh ſometimes 1500 Pounds, are ſcarcely 2 Pound Weight. Theſe are a few of the Experiments found in Mr. *Redi*'s Book, which are very many, and for moſt

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part very curious, but our room will allow us to inſert no more of them.

Materia Medica, or a Deſcription of ſimple Medicines generally uſed in Phyſick, fully and accurately demonſtrating their Uſes, Virtues, and Places of Growth, as alſo their operating and acting upon Human Bodies, according to the Principles of the new Philoſophy, Chymiſtry, and Mechaniſm, with an Appendix, ſhewing the nature and uſe of Mineral Waters; written originally by the learned Monſieur *Tournefort*, Botaniſt to the *French* King, faithfully tranſlated into *Engliſh*. *London*, Printed by *J. H.* for *Andrew Bell* at the *Croſs Keys* and *Bible* in *Cornhill*. 1708.

THE Author gives the following Account of his Book in the Preface.

Tho' the Materials of Phyſick, or the vaſt and ample Store of ſimple as well as compounded Medicines, which are or may be adminiſtred and made uſe of in the Methods of curing, will admit of ſeveral Diviſions, either in reſpect of the Kinds or principal Notes and Characteriſticks, whereby the Medicines are fitly diſtinguiſhed among themſelves, or from one another. Secondly, In regard of the Principles or Elements whereof they conſiſt, and laſtly, by reaſon of the Things from whence they are taken, *viz.* Plants, Animals, and Minerals or Foſſils, yet we ſhall confine our ſelves to that Order which is moſt commonly obſerved by Phyſicians of the beſt Note, and which is taken from the manifeſt Virtues and Faculties, which thro' a long Succeſſion of Years, and by ſo many and often repeated Experiments thoſe Medicines have been obſerved to be endued with, we are the more eaſily induced to follow this Method, becauſe the Endeavours of all thoſe who have beſtowed any Pains in improving Phyſick have been entirely directed to this Intent and Purpoſe, that Medicines might be pertinently and appoſitely employed to the End of Healing, wherefore we divide Medicines into thoſe that evacuate, and ſuch as alter without an Evacuation.

Evacu-

Evacuating Medicines are ſuch as manifeſtly expel the Humours out of the Body, but altering Medicines are ſuch as change the Qualities of the Humours and reduce them to their natural State.

Evacuating Medicines expel the Humours either upwards or downwards, or elſe thro' the whole Habit of the Body.

Thoſe that diſcharge the Humours upwards are either Vomits, expectorating, ſternutatory or ſalivating Medicines.

Thoſe that evacuate the Humours downwards are called either Purgatives, Diureticks, or Provokers of Womens Courſes.

And laſtly, thoſe that force the Humours thro' the whole Habit of the Body are called either Diaphoretick or Sudorifick.

Altering Medicines change the Humours, and reſtore them to their former State, either by diluting, thickning, or by little and little ſeparating the pure from the impure, by opening Obſtructions and ſtrengthening the Parts, whence they are called aperient, aſtringent, incraſſating and ſpecifick; we ſhall treat of each of theſe in their Order, and ſhall divide this whole Work into Two Parts, the firſt whereof ſhall treat of evacuating Medicines, and the other of altering.

But before we go any farther I am perſuaded it will not be amiſs to premiſe ſomething that may ſerve to the opening of a more eaſy and ready way to a right and clear underſtanding the Nature and Properties of mix'd Bodies. It is very probible that all ſorts of mix'd Bodies, whether Animal, Vegetable or Mineral, are compounded and actually conſiſt of four more ſimple Bodies, which we call Principles, *viz.* Water, Earth, Sulphur and Salt.

Water and Earth are ſo well known to every one, that none can be ignorant of the Nature and Properties of them, but the Knowledge of Sulphur and Salt is ſomewhat more obſcure.

Salt is a Body hard and ſtiff, endued with a notable Taſte, and which is eaſily diſſolved in Water if it be well mix'd with

it, neither doth it precipitate, or fall to the bottom, unleſs there be a greater quantity of it than can be diſſolved by that quantity of Water.

Of Salt there be two ſorts, *viz.* natural and artificial.

Of natural Salt there be three kinds, *viz.* urinous or volatile, acid and alkali.

The proper diſtinguiſhing Marks of an urinous Salt are plac'd firſt in that fœtid Smell which is perceived when Urine is pour'd upon Lime-Water; ſecondly, in a certain Ebullition or Effervescence with acid Liquors drawn from Sulphur or Allum, which are commonly called corroſive Spirits. Thirdly, in Rigidity, and in a ſharp and ſaline Taſte. Fourthly, in the milky Colour which it giveth to a Solution of Sublimate Mercury.

The very ſame Marks properly belong to an Alkali Salt, the Urinous ſmell only excepted; whereof an Alkali Salt, ſimply ſo called, is altogether deſtitute.

The proper diſtinguiſhing Marks of an Acid Salt are, Firſt, Its Effervescence with fixt Salts, urinous Liquors, and Salts extracted from Urine, Salt Armoniack, Harts-horn, and the reſt of that Kind. Secondly, In the purple Colour wherewith it enobleth a Solution of Turnſol, or a Paper dipt in its Solution. Thirdly, In the Coagulation of Milk. Fourthly, In Rigidity, and a Taſte for the moſt part Acid.

That there are ſuch different kinds of Natural Salts, may be thus proved;

Firſt, If Lime-water, or Oyl of Tartar, be poured upon an Infuſion of Earth, the ſame ſmell will plainly be perceived, as if the ſaid Liquors were poured upon Urine. The ſame very Smell doth ſtrike our Organs from the Walls of Houſes, after they have been new Whiten'd or Plaiſter'd over with Lime; from whence it clearly appears, that an urinous Salt is certainly diffus'd through the whole Earth, and its Atmoſphere.

Secondly, An Acid Salt doth clearly and manifeſtly diſcover

it

it ſelf, in Allum or Vitriol, in the Tartar of Wines, and in the Fruits of all thoſe Plants almoſt that have got a pulpy or fleſhly Rhine.

As to a natural alkalious Salt, ſo far as it differs from an urinous Salt, it is manifeſt, that ſuch a one is to be found naturally in Nitre, or that native Salt which aboundeth in *Egypt* and *Arabia*: For a Solution of Nitre, which having Oyl of Tartar pour'd upon it, ſendeth forth no urinous Smell; yet it preſently ſtrikes a milky Colour, pour'd on a Solution of ſublimate corroſive Mercury.

Out of the ſimple native Salts, other compounded Salts are naturally produc'd; that eſſential Salt, *viz.* which is naturally concreted from the Juice of ſome Plants, Native Salt Armoniack, Allum, Vitriol, Sea Salt, Nitre or *Egyptian* Salt, Nitre or Salt Petre. Urinous Salt joyn'd with an Acid, produces Salt Armoniack: Nor is it to be doubted, but ſome Urine is for the moſt part join'd with it, ſince Urine, beſides an urinous Salt and Spirit does likewiſe contain an Acid: But the Infuſion of Earth and Rubbiſh mix'd with Lime-Water hinders the production of a Saffron Colour, when a Solution of Corroſive Sublimate is poured upon them. This Experiment will luckily ſucceed if inſtead of the Infuſion of Earth we uſe a Solution of Sal Armoniac: From whence we may rationally conclude, that the Earth and its Atmoſphere abound with Sal Armoniack.

The diſtinguiſhing Marks of Sal Armoniack, are, 1. Its urinous Smell. 2. Its producing a milk white Colour in Lime-Water, when a Solution of ſublimate Mercury is added. 3. The Acid extracted from it by help of Fire, which clearly ſhows it ſelf by digeſting a Solution of it for ſome hours with a Solution of Turnſol.

Now, it may be ask'd, Whether this Native Sal Armoniack is naturally bred in the Earth, or gradually produc'd from the Urine and Excrements of Animals that live? The Reaſon of this may be, that ſeeing an Infuſion made of Earth dug out of the bottom of Pits or Wells ſeveral Fathoms deep; as alſo an Infuſion made of Rubbiſh taken from the tops of Chimneys, Hothouſes or Vaults do ſend forth an urinous Smell; 'tis very pro-

bable, that Sal Armoniack after the ſame manner as Nitre, Vitriol and Allum is bred in the Earth, and from thence convey'd into Plants with their nouriſhing Juice, and ſo paſſes into the Bodies of Animals feeding on thoſe Plants, and at laſt returns to the Earth again.

An artificial Salt is a fix'd Salt extracted from mix'd Bodies by the help of Fire, after they have been duly burnt and made into Ley filter'd and evaporated.

Note, That Natural Salts, eſpecially that which is Acid, are turn'd into fix'd Salts by the violence of Fire, which is prov'd from Tartar it ſelf. For crude Tartar abounds very much with an Acid, but when calcin'd, yields more fix'd Salt than any of the reſt; for while you calcine it, the greateſt part of its Alkalious Salt and Sulphur flies, and the remaining Acid is turn'd into a moſt ſharp Salt, ſtronger than any other Alkali. The more the Principles of mix'd Bodies are retain'd, the greater quantity of fix'd Salt is extracted from them: For Inſtance, if you calcine Wormwood with a ſlow and cloſe Fire, it yields a larger quantity of fix'd Salt than if you calcine it with an open Fire All which ſufficiently proves, that fix'd Salt is nothing but the Work and Product of the Fire; ſo that the proper definition of it is *a cloſe Conjunction of the Principles of mix'd Bodies forcibly bound together by the help of Fire.*

Some fix'd Salts are eaſily diſſolv'd when expos'd to the Air, as Salt of Tartar: Others are diſſolv'd with more difficulty, as Salt of Tamariſk, becauſe they abound with too large a quantity of an Acid, as happens to vitriolated Tartar. Having largely explain'd the Nature of Salts, I ſhall premiſe ſomething about the Nature of Sulphurs.

Sulphur is a Body or Subſtance inflamable, ſuch as is conſpicuous in Bitumen or Jewiſh Pitch, Petrolium or Oyl of Rock, Turpentine, common Pitch, Roſin, and Oyls drawn by Expreſſion from the Seeds of Plants, and others of that Nature.

Native Sulphur is extracted from Earth by infuſing it for 15 or 20 Days in highly rectified Spirit of Wine: For if you pour Water upon this Infuſion, it preſently grows white, and the Sulphur falls to the bottom of the Veſſel. Therefore

Therefore it ſhould not ſeem ſtrange that this Sulphur, being convey'd into Plants, diſcovers it ſelf in the form of Oil or Roſin.

The Tincture of Earth extracted with Spirit of Wine gives a yellow Colour to Lime-water, when a Solution of ſublimate Mercury is added. From whence it may again be concluded, that Earth abounds with Salt Armoniack, ſince the ſame very Colour is produc'd from a mixture of a Solution of Salt Armoniack and Urine with Lime-water.

The Author hopes theſe recited Experiments will very much conduce to a more clear underſtanding the Materials of Phyſick: For a mixture of thoſe things which may be diſſolv'd in a watry Menſtrum, and can excite an urinous ſmell by adding Lime-water or Oil of Tartar ſeem to contain a quantity of Salt Armoniack, but ſuch, as being thrown into the Fire burn or make a crackling noiſe, contain a quantity of Nitre. Such as render the infuſion of Galls of a blackiſh Dye ſeem to abound with Vitriol. Such as being diſſolv'd or infus'd in Spirit of Wine, do, by adding Water to the Tincture, let fall a Roſin conſiſting, no doubt, of ſulphurous Particles. Such as give the Solution or Tincture of Sun-flower, or Purple Dye, abound with an Acid: And laſtly, ſuch as produce a Milky or Saffron Colour, with a Solution of ſublimate Mercury, are very probably impregnated in Alkalious Salt.

This Book is divided into Two Parts. The firſt treats of Evacuating Medicines, and is divided into 8 Sections. The firſt whereof treateth of Medicines working or evacuating by Stool, call'd, *Purging Medicines*. The 2d is of thoſe that evacuate by Urine, or *Diuretical Medicines*. The 3d of Medicines evacuating by the Womb, or are forcing, ſuch as thoſe that provoke the Monthly Courſes in Women. The 4th, of Medicines diſcharging upwards from the Stomach, call'd *Emetick or Vomiting Medicines*. The 5th, of Medicines diſcharging Spittle from the Mouth, call'd, *Maſticatory or Salivating*. The 6th, of Medicines that evacuate by the Noſtrils, call'd, *Errhin and Sneezing Medicines*. The 7th, of Medicines evacuating upwards, call'd, *Expectorating*. The 8th and laſt Section treats of ſuch Medicines

Medicines as discharge the Humours thro' the whole habit of the Body, call'd, *Diaphoretick and Sweating Medicines.*

Each of these Sections is divided into Chapters, with a Description of the Simples; of the Place of their Growth; of the way how to use and choose them; of what Principles they are compos'd, what Quantities are to be given for a Dose, and what particular Distempers they are proper for.

The second Part consists of Altering Medicines, *viz.* such as are endued with the peculiar Faculty of altering and changing the Humours of the Body by reducing them to their natural State, Crasis or Temperament. Our Author gives us an account, that the Humours of the Body may recede or depart from their natural State two ways, *viz.* Either by the too great or violent Motion, or else by the too great Rest and Cessation of their constituent Particles, *i. e.* by the thinness or thickness of them.

He divides his account of Altering Medicines into two large Sections. The first of which explains the Nature of those Medicines that are indued with the Faculty of rendring the Humours of the Body more fluid, which are commonly reckon'd hot or heating Medicines. The second treats of such Medicines as are capable of abating and allaying the preternatural heat of the Humours, and these are call'd Refrigerating or Cooling and Thickning Medicines. These Sections are also divided into Chapters, with a Description of the Simples, and an Account of their Use, as in the first Part. He concludes with an Appendix concerning Mineral or Physical Waters, with an Account of their Use, and how to prepare the Body for them.

Joannis Fuſti Loſii Hildeſienſis Biga Diſſertationum, quarum prima exhibet ספר התפרח *ſive Librum de Pomo* Ariſtotelis, *quod moribundus in manu geſtaverit, cujus odore, adſtantibus aliis Philoſophis, ad confortationem virium frueretur quo uſque diſcurſum abſolviſſet. Ex Arabica Lingua olim in Ebræo Rabbinicam tranſlatum à R.* Abraham Levita, *nunc Latine verſum, & Notis illuſtratum. Altera Oſtendit conſenſum Kabbaliſticorum cum Philoſophia Academica & Peripatetica Dogmatum, per quinque Capita; cum Præfatione Dn. D. Jo.* Henrici Maii. *SS. Theol. & LL. OO. P. P. in Inclita Ludoviciana* Giſſæ Haſſorum, 1706. *i. e.* Two Diſſertations of *John Fuſtus Loſius*; the firſt of which contains the Book of *Ariſtotle*'s Apple which he held in his Hand when he was a dying, by virtue of which he finiſh'd the Diſcourſe he made to the reſt of the Philoſophers. Formerly tranſlated from Arabick into Hebrew by *Rabbi Abraham Levita*, and now tranſlated into Latin, and illuſtrated with Notes. The ſecond Diſſertation ſhows the Conformity of the Cabaliſts with the Academicks and Peripateticks, in 5 Chapters; with *Henry Maius*'s Preface, formerly Publick Profeſſor of Divinity and Law in the famous Univerſity of *Louis*. At *Gieſſen* in *Heſſe* 1706 in 4°. The firſt Diſſertation contains *p.* 96. The ſecond *p.* 52.

MEN had different Opinions formerly about the manner of *Ariſtotle*'s Death; ſome ſay he was condemned, as *Socrates*, to drink Hemlock, others that he threw himſelf into *Eurypus*; and here we have an Account that he died ſurrounded by Philoſophers, with whom he very calmly convers'd; and when dying let fall the Apple, whoſe ſmell kept him alive till he finiſh'd the Diſcourſe that they pray'd him to make, in order to teach them not to fear Death.

Our Philoſopher deſcribes here the Advantages of the State of the Soul ſeparated from the Body, which hinders it from advancing in Vertue and in the Knowledge of Truth, aſſociated with other perfect and happy Souls, and in ſome manner made Divine. He grounds the certainty of another Life upon this, that the beſt Men are not always the happieſt in this World, which

which makes Death desirable to a true Philosopher, *i. e.* to him that leads a pure and innocent Life, and despising the Pleasures of this World, places his Pleasure in contemplating the Power, Greatness and Wisdom of his Creator, either in the Structure and Revolution of the Celestial Bodies, or in the Construction and Motion of those Parts of which humane Bodies are composed. Of what use, continues *Aristotle*, is a long Life to a Man that has already doom'd himself to Death by depriving himself of sensible Pleasures? He ought to rejoyce when the time is come that his Soul shall return to its Creator, and enjoy the Glory of the Divine Majesty: But woe to the sinful Soul, concludes he; it can never ascend to the Place from whence it came, the weight of its evil Actions hinders it from going thither. Finally, he denies the Title of a perfect Philosopher to one who is afraid at the Approach of Death, and declares him worthy to be exposed to the Laughter of all those who had formerly heard him discourse of Philosophy. Trust in God is here reckon'd one of the principal Motives that makes a wise Man couragious.

It seems Death durst not interrupt *Aristotle*; but as soon as he gave over speaking, the Apple fell from his Hand, and he died.

M. *Josius* thinks the Author of this Work may probably be an Arabian Jew, one of *Aristotle*'s Followers.

Some

Some familiar Letters between Mr. Locke *and ſeveral of his Friends.* London, *Printed for* A. *and* J. Churchill, *at the* Black-Swan *in* Pater-Noſter-Row. 1708. 8*vo. pag.* 540.

THE Publiſher of this Volume of Letters aſſures us that they are the Genuin Production of thoſe Gentlemen to whom they are aſcribed; and that in the Publication of 'em, he has principally had a view to ſuch as contain not only what Civil and Polite Converſation Friendſhip produces among Men of Parts, Learning and Candor, but alſo to thoſe which are fraught with variety of Matter relating to Learning, and particularly to Mr. *Lock*'es Notions in his *Eſſay concerning Human Underſtanding*, and ſome other of his Works. I ſhall pick out here and there a Letter to give the Reader a brief Account of for a Specimen of the Collection; taking notice in the firſt place that the whole Collection are *Engliſh* the former part, and the latter *Latin*, with two or three *French* interſpers'd: The *Engliſh* are writ all to Mr. *Molyneux* of *Dublin*, ſave a few to his Brother a Phyſician; and the *Latin* and *French*, all to the famous Monſieur *Limborch*.

Mr. *Molyneux* in a Letter from *Dublin* (dated *Dec* 22. 1692.) amongſt other particulars takes notice to Mr. *Locke*, that his Diſcourſe concerning Man's Liberty and Neceſſity in his *Eſſay concerning Human Underſtanding*, requires ſome farther Explication, the Thread being ſo wonderfully fine Spun, that at laſt the great Queſtion about Liberty and Neceſſity ſeems to vaniſh: Herein (ſays Mr. *Molyneux*) Mr. *Locke* ſeems to make all Sins to proceed from our Underſtanding, or to be againſt Conſcience, and not from the depravity of our Wills: Whereas (continues he) it ſeems harſh to ſay that a Man ſhall be Damn'd, becauſe he Underſtands no better than he does. He obſerves farther, That what Mr. *Locke* ſays concerning *Genera* and *Species* is unqueſtionably true, and yet that it ſeems hard to aſſert that there is no ſuch Sort of Creatures in Nature as Birds: For tho' we may be ignorant of the particular Eſſence that make a

Bird to be a Bird, or that determins and diſtinguiſhes a Bird from a Beaſt, or the juſt Limits and Boundaries between each; yet we can no more doubt of a Sparrow's being a Bird, and an Horſe being a Beaſt, than we can of this Colours being Black and the other White, tho' by Shades they may be made ſo gradually to vaniſh into each other, that we can't tell where either determines. In anſwer to the former of which particulars Mr. *Locke* ſays (in a Letter from *Oates*, dated *January* 20th. $169\frac{4}{5}$.) that he does not wonder to find his Friend think his Diſcourſe about *Liberty* a little too fine ſpun, ſince he had ſo much that thought of it himſelf, that he ſaid the ſame thing of it to ſome of his Friends before it was Printed, and told 'em that upon that Account he judg'd it beſt to leave it out, but they perſwaded him to the contrary: When the Connection of the parts of his Subject brought him to the Conſideration of *Power*, he ſays he had no Deſign to meddle with the Queſtion of *Liberty*, but barely purſued his Thoughts in the Contemplation of that Power in Man, of chooſing or prefering, which we call the Will, as far as they would lead him without any the leaſt byaſs to one ſide or the other; or if there was any leaning in his Mind, it was to the contrary ſide, to that where he found himſelf at the end of his purſuit: But doubting that it bore a little too hard upon Man's *Liberty*, he ſhew'd it to a very Ingenious but profeſs'd *Arminian*, and deſir'd him, after he had conſider'd it to tell him his Objections, if he had any; who frankly confeſs'd he could carry it on farther. Mr. *Locke* confeſſes he thinks there might be ſomething ſaid, which with a great many Men would paſs for a ſatisfactory Anſwer to Mr. *Molyneux*'s Objection; but it not ſatisfying himſelf, he neither put it into his Book, nor into this Letter. He proceeds to ſay, That if he has put any fallacy upon himſelf in all that Deduction, as it may be, and he has been ready to ſuſpect it himſelf, his Friend will do him a very acceptable Kindneſs to ſhew it him, that he may reform it. But he declares, That if Mr. *Molyneux* will argue for or againſt *Liberty* from Conſequences, he will not undertake to anſwer him, for in this reſpect he owns freely the Weakneſs of his Underſtanding; that though it be unqueſtionable that there is Omnipotence and Omniſcience in God our Maker, and though he can't have a clearer Preception of any Thing than that he is free, yet he can't make Freedom in Man conſiſtent with Omnipotence and Omniſcience in God, though

though he is as fully perſwaded of both as of any Truths he moſt firmly aſſents to. Upon this Account he tells us, That he has long ſince given off the Conſideration of that Queſtion, reſolving all into this ſhort Concluſion, That if it be poſſible for God to make a free Agent, then Man is free; though, he confeſſes, he ſees not the Way of it.

As to the Objection that Mr. *Molyneux* raiſes about *Species*, Mr. *Locke* tells him, That he fears he is fallen into the ſame Difficulty which he often found himſelf under when he was writing upon that Subject; where he was very apt to ſuppoſe diſtinct *Species* he cou'd talk of without Names: For he deſires Mr. *Molyneux* to conſider what it is he means when he ſays, *That we can no more doubt of a Sparrow's being a Bird, and an Horſe's being a Beaſt, than we can of this Colour being black, and the other white*, &c. but this, that the Combination of ſimple Ideas which the Word Bird ſtands for, is to be found in that particular Thing we call a Sparrow: And therefore he hopes he has no where ſaid *there are no ſuch Creatures in Nature as Birds*; if he has, it is both contrary to Truth and to his Opinion. This he does ſay, That there are real Conſtitutions in Things from whence thoſe ſimple Ideas flow which we obſerve combin'd in 'em. And this he ſays farther, That there are real Diſtinctions and Differences in thoſe real Conſtitutions one from another; whereby they are diſtinguiſh'd one from another whether we think of them, or Name 'em or not: But that that whereby we diſtinguiſh and rank particular Subſtances into *Sorts*, or *Genera* and *Species*, are not thoſe real Eſſences or internal Conſtitutions, but ſuch Combinations of ſimple Ideas as we obſerve in them.

In a Letter from *Dublin* (*March* 2. 169$\frac{4}{5}$) among other Particulars, Mr. *Molyneux* asks Mr. *Locke*, whether he would not do well to inſiſt more particularly than he has done in the firſt Edition of his Eſſay on the *Eternæ Veritates*, and the *principium Individuationis*? And then minds him of an Error in Fact in *Pag.* 96. *Sect.* 9. of that Edition, where he ſays, that Man's Eye may diſtinguiſh a ſecond of a Circle whereof its ſelf is the Center. In oppoſition to this Mr. *Molyneux* ſays, 'tis certain that few Mens Eyes can diſtinguiſh leſs than 30 Seconds, and moſt not under a Minute, as is manifeſt from what Mr. *Hook* laysdown in his

Animadverſions on the firſt Part of *Hevelinus Machina Cœleſtis*, Pag. 8, 9, *&c.* He concludes this Letter with what he calls a *Jocoſe Problem*, that upon Diſcourſe with ſeveral concerning Mr. *Locke*'s Book and Notions, he has propos'd to divers ingenious Men; and which he could hardly meet with any that could give him the Anſwer to, at the firſt Daſh directly. The Queſtion is this; Suppoſe a Man born blind, and now adult, and taught by his Touch to diſtinguiſh betwixt a Cube and a Sphere of Ivory, nearly of the ſame Bigneſs; ſo as to tell when he felt the One, and when the other: If we ſuppoſe alſo the Cube and Sphere on a Table, and the blind Man brought to his Sight; the Queſtion is, whether by his Sight, before he touc'd them, he could diſtinguiſh and tell which is the Globe, which is the Cube? Mr. *Molyneax* anſwers he could not: For though he knows by Experience how a Globe and how a Cube affects his Touch, yet he knows not yet by Experience that what affects his Touch ſo and ſo muſt affect his Sight ſo and ſo; or a protuberant Angle in the Cube that preſſed his Hand unequally, ſhall appear to his Eye as it does in the Cube. This Problem Mr. *Locke* publiſhes in the next Edition of his Eſſay; and as to the Error in Fact, he acknowledges it, and ſays, That in himſelf it was an Error in the Expreſſion, in as much as he meant a Minute, but by miſtake called $\frac{1}{60}$ of a Degree a Second. As to the *Eternæ Veritates*, Mr. *Locke* in a Letter from *Oates* (*Aug.* 23. 1693.) obſerves, that all general Truths are ſuch, and conſequently that there is no entering into particulars, though by Miſtake ſome Men have ſelected ſome, as if they alone were eternal Verities. The *Principium Individuationis* produc'd Mr. *Locke*'s famous Chapter of *Identity* and *Diverſity*, which he ſent to Mr. *Molyneux* for his Remarks before he publiſh'd it, in the ſecond Edition of his Book.

As to this Chapter, Mr. *Molyneux* in a Letter from *Dublin* (*December* 23. 1693.) obſerves upon the 22*d* Section, where Mr *Locke* gives the Reaſon why the Law may juſtly puniſh a a ſober Man for what he did when Drunk, or a waking Man for what he did when walking in his Sleep; that though this Reaſon be true and full with Relation to the Night-walker, yet he conceives it not ſo full in the Caſe of the drunken Man. For Drunkeneſs, ſays he, is it ſelf a Crime, therefore no one

one ſhall alledge it in Excuſe of another Crime: And in the Law we find that *killing a Man by Chance-medly is not capital*, yet if I am doing an unlawful Act, as ſhooting at a *Deer* in a Park to ſteal it, and by Chance medly I kill a Man unawares, this is capital; becauſe the Act wherein I was engag'd, and which was the Occaſion of this Miſchief, was in it ſelf unlawful, and not to be pleaded in Excuſe. In the Caſe of the Night-walker he allows Mr. *Locke*'s Anſwer to be full and ſatisfactory; but that in the Drunkard's Caſe, he looks upon as ſomewhat ſhort: Night-walking he makes a Sort of Diſtemper not to be help'd or prevented by the Patient; but Drunkenneſs a deliberate Act, which a Man may eaſily avoid and prevent. He adds, That, whatever the Law appoints in this Caſe, he thinks, were he on the Jury of one who walking in his Sleep kill'd another, he ſhould not violate a good Conſciece if he acquitted him; he being certainly during thoſe fits *Non compos mentis*. To this Mr. *Locke* anſwers in a Letter from *Oates* (*Jan.* 29. 169$\frac{3}{4}$) that whereas Mr. *Molyneux* doubts whether his Anſwer be full in the Caſe of the Drunkard; to try whether it be ſo or no, we muſt conſider what he is there doing. And he is there ſhewing that Puniſhment is annex'd to Perſonality, and Perſonality to Conſciouſneſs, whence the Query ariſes; How then can a Drunkard be puniſh'd for what he did whereof he is not conſcious? Mr. *Locke*'s Anſwer to this Query is this, That human Judicatures juſtly puniſh him becauſe the Fact is prov'd againſt him, but want of Conſciouſneſs cannot be prov'd for him. This Anſwer *Molyneux* thinks not ſufficient; but would have Mr. *Locke* to add the common Reaſon, that Drunkenneſs being a Crime, one Crime cannot be alledg'd in excuſe of another. Whereas this Reaſon, how good ſoever in it ſelf, Mr. *Locke* thinks cannot be us'd by him as not reaching his Caſe, and having nothing at all to do with Conſciouſneſs: Nay, he looks upon it as an Argument againſt him, for if a Man may be puniſh'd for any Crime which he committed when drunk, whereof he is allowed not to be conſcious, it overturns his Hypotheſis. As to Mr. *Molyneux*'s Caſe of Shooting a Man by Chance when ſtealing a Deer being made capital he allows it to be juſt; but deſires him to conſider that it concerns not his Argument, there being no doubt of Conſciouſneſs in that Caſe, but only ſhews that any criminal Action infects the Conſequences of it.

But Drukenneſs (ſays he) has ſomething peculiar in it when it deſtroys Conſciouſneſs; and ſo the Inſtances Mr. *Molyneux* brings, juſtifie not the Puniſhing of a drunken Fact that was totally and irrecoverably forgotten, which the Reaſon that he gives being ſufficient to do it well enough removed the Objection, without entering into the true Foundation of the Thing; and ſhewing how far it was reaſonable for human Juſtice to puniſh a Crime of a Drunkard, which he cou'd be ſuppos'd not conſcious of; which wou'd have uſeleſly engag'd him in a very large Diſcourſe, and an impertinent Digreſſion. For he asks Mr. *Molyneux*, If a Man by intemperate Drinking ſhou'd get a Feaver, and in the Frenzy of his Diſeaſe, which laſted not perhaps above an Hour, committed ſome Crime; ought he to be puniſh'd for it? If he would not think this juſt, he asks him how he can think it juſt to puniſh him for any Fact committed in a drunken Frenzy without a Feaver? Both having the ſame criminal Cauſe, *viz.* Drunkenneſs, and both committed without Conſciouſneſs. They have other two Letters upon this Subject, for which I muſt leave the Book I am giving a brief Specimen of, to be conſulted by the curious Reader.

In a Letter to Mr. *Locke*, (*Aug.* 24, 1695) in commendation of his *Thoughts of Education*, Mr. *Molyneux* tells him what wonderful Effects that Way has had upon his own Child; who when he was turn'd five Years old could read perfectly well; and on the Globes could have trac'd out and pointed at all the noted Parts, Countries and Cities of the World; and by five and an half could perform many of the plaineſt Problems on the Globe, as the Longitude and Latitude, the Antipodes, the Time with them and other Countries, *&c.* and this by way of Play and Diverſion, ſeldom call'd to it, never chid or beaten for it. About the ſame Age, he tells us, he could read any Number of Figures not exceeding ſix Places, break it as you pleaſe by Cyphers or Zeros. By the Time he was ſix (continues he) he could manage a Compaſs, Ruler and Pencil very prettily, and perform many little Geometrical Tricks, and advanc'd to Writing and Arithmetick. He had then been three Months at *Latin*, could read a *Gazette*, and in the large Maps of *Sanſon* ſhew moſt of the remarkable Places as he went along, and turn to the proper Maps. He had been ſhewn ſome Dogs diſſected, and could give ſome little Account of

of the grand Traces of Anatomy. And as to the Formation of his Mind, Mr. *Molyneux* ſays. that he does not believe that any Child had ever his Paſſions more perfectly at command, he being obedient and obſervant to the niceſt Particular, and at the ſame Time ſprightly, playful and active. Mr. *Locke*, in a Letter before this, gives another Account of a yong Gentleman equally advancing in Learning, *&c.* by the ſame Method.

After ſeveral intervening Letters upon various Subjects, as the Controverſie betwixt Mr. *Locke* and Mr. *Lowndes* about the *Coinage*, the *Reaſonable of Chriſtianity*, Mr. *Wynne*'s Abridgement of Mr. *Locke*'s Eſſay, *&c.* Mr. *Molyneux* in a Letter (*Sept.* 26. 1696) tells Mr. *Locke*, that as to the *Reaſonable of Chriſtianity* he does not find but that it is pretty well approv'd of in *Ireland* amongſt candid unprejudic'd Men who dare ſpeak their Thoughts: And he tells him what a very learned and ingenious Prelate ſaid to him on that Occaſion. He ask'd him whether he had read that Book, and how he lik'd it? The Biſhop anſwer'd very well; and that if Mr. *Locke* writ it, 'twas the beſt Book he ever labour'd at: But, ſays the Biſhop, if I ſhould be known to think ſo, I ſhould have my Lawns torn from my Shoulders.

In a Letter bearing Date, *May* 15. 1697, Mr. *Molyneux* takes Notice of Mr. *Lock*'s Controverſie with the late Biſhop of *Worceſter*, and gives him his Opinion of his firſt Letter to that great Man in a Paragraph of a Letter, which he receiv'd concerning it from a great *Iriſh* Prelate, which contains theſe Words; " I read Mr. *Locke's Letter to the Biſhop of* Worceſter " with great Satisfaction, and am wholly of your Opinion, " that he has fairly laid the great Biſhop on his Back; but " 'tis with ſo much Gentleneſs as if he were afraid not only " of hurting him, but even of ſpoiling or tumbling his Cloths: " Indeed I can't tell which I moſt admire, the great Civility " and good Manners in his Book, or the Force and Clear- " neſs of his Reaſonings. And I fancy the Biſhop will thank " him in private, and trouble the World no more with this " Diſpute ". Mr. *Molyneux* is, after this, very ſharp upon Dr. *Edwards* of *Cambridge* for his Controverſie with the Author of the *Reaſonableneſs of Chriſtianity*; I think his Words rather too hard to be tranſcrib'd into this Place. In

In a Letter of *July* 20. following, He takes Notice of Mr. *Brown*'s Anſwer to *Toland*'s *Chriſtianity not myſterious*; who in that Book ſays, That he could undertake to demonſtrate the Immateriality of the Soul, and to ſhew the Falſity of Mr. *Lock*'s Argumentation, when he ſays, *That we have no Proof but that God may communicate a Power of Thinking to a certain Syſtem of Matter.* Mr. *Molyneux* looks upon this as bare Aſſertion and Promiſe, and fears that he ſhall never ſee that Demonſtration from him. Two Things, he ſays, he can never forgive this Author in this Book; the one is the foul Language and Opprobrious Names he gives Mr. *Toland*; the other, his calling in upon ſeveral Occaſions the ſecular Magiſtrate, and delivering up Mr. *T*---- to a civil Puniſhment. This indeed, ſays Mr. *Molyneux*, is a killing Argument; but ſome will be apt to ſay, That where the Strength of his Reaſon fail'd him, there he flies to the Strength of the Sword.

I ſhall conclude my Account of the *Engliſh* Part of this Book with obſerving, That Mr. *Locke* often gives hopes in his Letters of a *Demonſtration of Morality* which yet he liv'd not to perform; and that he ſometimes had Thoughts of enlarging his *Eſſay* with a Chapter *Of the Conduct of the Underſtanding*; and another by Way of Examination of Father *Mallebranche*'s Opinion of *ſeeing all Things in God*: But neither did he live to give his finiſhing Hand to theſe. As he left them they are Printed in his *Poſthumus* Works, for Mr. *Churchill*. *Anno* 1706.

THE

THE *Latin Letters*, as I have already obſerv'd, are all betwix't Mr. *Locke* and Monſieur *Limborch*: I ſhall give a brief Account of the ſubject Matter of ſome few of them for a Specimen of the whole, and leave the Reader to have recourſe to the Book it ſelf for full Satisfaction.

In a Letter from *Amſterdam* (*March* 26. 1697) Monſieur *Limborch* is large upon Mr. *Locke*'s *Reaſonableneſs of Chriſtianity*; which, he tells him, after its appearing in *French*, he had read over and over again. He afterwards takes Notice, that an Account of this Book is given in the *Leipſick* Tranſactions for *October* 1696. and that in this Account of the Book, they endeavour by all Ways to render the Author as odious as poſſible, in revenge of his Contempt of the *Syſtematical* Divinity. He tells us on the Contrary, That they cry up the then Mr. *Edwards* of *Cambridge*, for his excellent Writings againſt the *Socinians*; and eſpecially for his Piece on *The Cauſes and Occaſions of the Atheiſm of the preſent Age*, in which he often charges the Opinions of the Author of *The Reaſonableneſs of Chriſtianity* with a Tendency towards *Socinianiſm* and *Atheiſm*. Mr. *Limborch* acknowledges, That though he has writ a Syſtem of Divinity himſelf, yet he has not ſuch a value for the Syſtematical Way, as not to prefer this little Piece before many Syſtems: Nay, he confeſſes, That he has furniſh'd himſelf with more true Divinity from hence, than from many elaborate Syſtems. The Reaſon why the Syſtematical Divines are ſo angry with *The Reaſonableneſs of Chriſtianity*, he takes to be this, That his Divinity is too eaſie and looſe, and does not ſtrive to confine Salvation within the narrow Limits of human Deciſions, nor makes the Confeſſions of any Sect of Chriſtians the Standard of Orthodoxy, but regulates himſelf in both immediately by the Word of God. This, Mr. *Limborch* tells us, is the Crime, which, in the Eyes of Syſtematical Doctors, ought to be ſtigmatiz'd with the ignominious Titles of *Socinianiſm* and *Atheiſm*, as if every one who will not give himſelf up blindly to adore meer human Decrees, ought, upon this ſingle Account, to be look'd upon as an *Atheiſt*. As to

Mr. *Limborch* himſelf he tells Mr. *Locke*, That he likes the Deſign of the Author of *The Reaſonableneſs of Chriſtianity* exceedingly well, and thinks that he has well attain'd the End he aims at. He expreſſes his Satisfaction in two Things, in a more particular Manner; in the accurate Method in which the Author lays down the evangelical Hiſtory in his Ninth Chapter, where he clears ſeveral ſeemingly obſcure Paſſages in the Evangeliſts: And in his plain and clear Deduction of thoſe Arguments, in which he ſhews the Reaſon why *Jeſus Chriſt* did not declare in expreſs Words that he was the *Meſſias* during his ſtay upon Earth. Theſe Thing being this Author's own, he ſays, ſufficiently ſhew his Wit, Judgment and Sagacity. After having given his Judgment of this Book, Mr. *Limborch* proceeds, according to Mr. *Locke*'s Deſire, to propoſe what Difficulties he conceives to attend ſome Paſſages in it: Which I can't as much as enumerate here, but muſt leave the Reader to peruſe them in the latter Part of this Letter.

After a great many intervening Particulars about the Proof of the Unity of the Deity, about Mr. *Locke*'s Controverſie with the Biſhop of *Worceſter*, about the Suffering of ſeveral Perſons in *England* at *Norwich* and other Places for Hereſie, *&c.*

Mr. *Limborch*, in a Letter from *Amſterdam*, (*March* 30. 1701.) begins a Controverſie with Mr. *Locke* about *Liberty*; upon which Subject ſeveral large Letter paſs between them: And Mr. *Locke*, in a Letter from *Oates*, (*Sept.* 28. 1702.) anſwers two Querys of Mr. *Limborch* in a preceding Letter, *viz.* Whether Mr. *Locke* makes Man free in *Will* and *Underſtanding*? And whether the Actions of *Willing* and *Underſtanding* be free? after this Manner; *Firſt*, in general, That in his Opinion, Man is free in every Act either of *Willing* and *Underſtanding*, if he could have abſtain'd from that Act, if otherwiſe not. *Secondly*, in particular, As to the *Will* he anſwers, that there are ſome Caſes, in which a Man cannot but *Will*, and that in theſe he is not free; but that in others, in which he may or may not Will, he is free. *Thirdly*, As to the Act of *Underſtanding*, he looks upon the Word it ſelf to be ambiguous, as it may either ſignifie the Act of thinking upon any Subject; and in this Senſe Man is generally free: *V. G.* A Man is free either

to

to think of *Adam*'s Sin, or to remove his Thoughts to the City of *Rome*, or to think of the Art of War in its preſent Perfection; in all which and infinite ſuch like, he is free, becauſe he may or may not think of any of 'em at pleaſure: Or the Act of *Underſtanding* may ſigniſie that Action of the Mind by which I perceive any Thing to be true; and in this Action, *viz.* That the three Angle of a right lin'd Triangle are equal to two right Angles; I ſay, in perceiving or underſtanding the Truth of this, a Man is not free, becauſe when he apprehends the Demonſtration, he muſt of neceſſity ſee the Truth of it. A Man may, if he pleaſe, not open his Eyes, or not caſt them on this or that Object; but if he does open them, and turn them upon the Sun or Moon, he can't help ſeeing their Light and Figure, ſuch as they then offer themſelves to the Sight: This Inſtance of the Eye, Mr. *Locke* applies to the *Underſtanding* in the laſt Caſe. Mr. *Limborch*, in a following Letter, acknowledges, that Mr. *Locke* is in the Right, in what he ſays concerning the Liberty of Man in the Action of *Underſtanding* and *Will*, viz. *Firſt*, That Man is free in all thoſe Actions which he has a Power to abſtain from. *Secondly*, That there are ſome Caſes in which Man cannot but *Will* and *Act*: But Mr. *Limborch* aſſerts, That in all moral Actions, *&c.* the Neglect of which involves a Man in guilt, Man is free; no Body being blame worthy for not doing what is out of his Power, or for doing what he could not avoid. *Thirdly*, That Man has it in his Choice, what Objects he will chooſe to think upon; but this Action, he obſerves, if we will ſpeak properly, belongs not ſo much to the Underſtanding as to the Will, in as much as a Man ceaſes to think of one Object, and turns his thoughts upon another, becauſe he wills both theſe Particulars. As to that Action of the Underſtanding by which a Man perceives any Thing to be true, Mr. *Limborch* acknowledges, that Mr. *Locke* is in the Right in aſſerting that it is not free; and this not only in Matters knowable ſcientically, but in others where we have no Evidence: He conceives, that this Neceſſity takes place even where a Thing is obſcure and doubtful, without any evident Proof; nay, where the Proofs on each Side hang in *Equilibrio*, a Man in theſe Caſes either lightly aſſenting, or doubting, or ſuſpending his Aſſent neceſſarily in proportion to what Evidence he has to determine him. Indeed Mr. *Limborch* acknowledges, That in this Sort of inevident Knowledge or Opinion

it often happens, that without any true Light a Man may either aſſent fully or change his Opinion; but this, he ſays, proceeds not from the *Underſtanding* but the *Will*: We know, (continues he) that our Paſſions give a ſtrong biaſs to our Judgment, ſo that by indulging any one Paſſion which hurries me againſt the Truth, I can draw my Judgment and Aſſent to the ſame ſide. Hence this Judgment becomes a mixt Action, partly of the *Underſtanding*, and partly of the *Will*; as far as it is an Action of the *Underſtanding*, or perceptive of a Thing it is neceſſary; but whatſoever there is in it that is Free proceeds from the *Will*; as I may at leaſure build ſuch or ſuch a Judgment upon ſuch or ſuch Reaſon, as ſufficient Foundations. Such a mixt Action as this Monſieur *Limborch* makes *Faith* to be in the 9th Chapter of the 5th Book of his *Chriſtian Theology*. S 21, 22, 23 And Shews there fully how the Actions of *Underſtanding* and *Willing*, concurr in the Chriſtian Faith.

I ſhall conclude my Account of this Book with Mr. *Limborch*'s Obſerving in his laſt Letter to Mr. *Locke* in this Collection that the Seeds of Chriſtian Peace and Moderation which he has ſown in his *Letters for Toleration*, though they be now trodden under Foot, will in time bring forth their deſired Fruit: This though Mr. *Limborch* ventures to foretell, yet he confeſſes that when he conſiders how ſervilely moſt Men devote themſelves to the ſupporting of meer Human Conſtitutions, he can ſcarce hope that they will ever ſo far lay by their Prejudices and Paſſions as to weigh the Reaſon which Truth ſtands upon, with Impartial Sincerity, and to embrace her, where ever they find her. As to the Servile Veneration paid to meer Human Conſtitutions even by the Reform'd, notwithſtanding their proteſting to the contrary when they threw of the Papal Tyranny, he produces a very peculiar inſtance of this kind, even in his own Country. And Mr. *Locke* in his laſt to him ſays, that, though he had been ſufficiently acquainted with the ſervility of Mens Minds in theſe Caſes from a long Experience, yet he has no better hopes of the time to come; 'till it ſhall pleaſe God of his infinite Mercy to reſtore his Church by the ſecond coming of his Son, our Bleſſed Saviour.

The whole Art of Husbandry, or the way of managing and improving of Land: Being a full Collection of what hath been writ either by antient or modern Authors; with many Additions of new Experiments and Improvement not treated of by any others. As also an Account of the particular Sorts of Husbandry us'd in several Counties; with Proposals for the farther Improvement. To which is added the Country-man's Calendar, what he is to do every Month in the Year. By J. Mortimer, *F. R. S. The Second Edition corrected.* London: *Printed by* J. H. *for* H. Mortlock, *at the* Phenix; *and* J. Robinson, *at the* Golden Lyon *in St.* Paul's Church-yard. 1708. 8*vo. Pag.* 632.

THERE having been no Account given in this Work of this Book when it first came out, and yet it being look'd upon as well deserving to be taken notice off, accordingly it was thought proper to say something of it at this Time, since it is now come to the second Impression.

The great Improvements that have been made of late in Husbandry, and the small Collections that are extant of them, with the difficult Reception these Improvements meet with, because of the Ignorance of some, and the wedded Opinions of the Generality to the Custom and Practice of their Neighbours, our Author looks upon as a sufficient Justification of this Undertaking: The Design of which, is, *First*, to give an Account of the Common Way and Method of managing Land, and the several Ways of ordering the various Sorts of Grains. And *Secondly*, To shew what new Improvements have been made, and what different Methods are us'd in most Places, and upon what Sort of Land, with the Reasons of such Improvements; so that every one may be able to Judge of their own Practices, and to see what Additions are necessary and most reasonable to be made use of for the mprovement of their Interest. For Labour and Industry being (as our Author observes) the chief Things to make Land valuable, it concerns the judicious Husband-man to consider the Nature of the Ground he is to spend his Time, Cost and La-

Labour upon; and whether it be fit for Meadow, Paſture, Corn, Orchard or Gardens; and likewiſe what Sort of Beaſts and other Animals 'tis beſt to ſtock it with; and what Sorts of Pulſe, Trees, Fruits, *&c.* is beſt for each particular Soil; and likewiſe the particular Ways and ſeveral Methods us'd to improve and manage Land to the beſt Advantage, with the Coſt and Produce of it. Concerning all theſe Particulars, our Author endeavours in this Piece to give as plain and diſtinct Directions as he can: And in order to it, begins with the Incloſing of Land, as what lays a Foundation for Induſtry and good Husbandry, becauſe of the Security it gives a Man in the quiet Poſſeſſing the Beneſit of his Labour and Care. Upon this Subject, he induſtriouſly waves the Diſputes that have been produc'd to prove the Advantages or Diſadvantages of Incloſures and open Fields, becauſe he thinks theſe two Things alone ſufficient to prove the Advantage of Incloſures, *viz.* The great Quantities of Ground daily inclos'd, and the encreaſe of Rent that is every where made by thoſe who encloſe it. And the Method that he follows, is to give an Account of the ſeveral Sorts of Fences, the Cuſtoms and Uſages about them, and the Manner and Way of propagating of them, with the Coſt and Charges of their making. This whole Work conſiſts of fifteen Book. The *Firſt* begins upon this Subject of Fences; and treats afterwards of Paſture and Meadow Lands; of the Making of Hay; of ſeveral Sorts of Graſs-ſeed, as *Clover*, St. *Foin*, *La Lucern*, *Rey-graſs*, *Trefoil* and ſeveral other Graſſes.

In the *ſecond* Book our Author treats of arable Land and Tillage; and begins what he offers upon this Subject with a Deſciption of the Plough; then he proceeds to give an Account of the Way of Plowing, Sowing and Ordering of *Land* for Corn; and after this, to ſhew how to order each Grain, and what Soil is proper for them. And after this, in the *third* Book, gives an Account of the ſeveral Sorts of Soil, with their Natures and Qualities. All Sorts of Land he reduces to ſandy, gravelly, chalky, ſtoney, rocky, hazely, black Earth, Marſh or Boggy, and Clay Land; the Laſt he divides into black, blue, yellow and red. In many Places he obſerves ſeveral of theſe Soils are mix'd together; and where they are ſo, that they are much better than when alone, eſpecially where the Hot and Dry is mix'd with

with the Cold and Moiſt: For which Reaſon any Clay laid upon Sand or Gravel, or Sand upon Clay, is the beſt Manure; becauſe it alters and changes the Nature of the Land it ſelf, whereas Dung and ſuch Things improve them but for a Time. In this Book, after having laid down ſome general Rules for the knowing of fruitful and unfruitful Soils, and given ſome Rules for the ordering of Land for Corn, our Author proceeds to give an Account of their natural produce; and concludes with an Experiment of Mr. *Houghton*'s, whereby to know what Quantity of Sand any Earth or Marl is mix'd with, which may be of uſe to try the Nature of ſeveral ſorts of Land by.

He took (ſays our Author) a piece of Clay ſuch as the Brewers ſtop their Casks with, which is commonly a ſort of a Yellow Tile-Clay, which Weigh'd 4½ Ounces *Aviordupois*, this he diſſolv'd in Water, and pour'd of the thick into another Baſon, till all was gone but the Sand which ſtuck not together, but lay looſe in the Water, and when it was dry, would run like Hour-Glaſs-Sand, of which he had about the Quantity of an Ounce; being of a Yellow-Colour and ſometimes Gliſtering, and ſome little Stones and other foul Matter was with it; and when the Clay was ſettled he pour'd of the Water and left the reſt to dry in a Pewter-baſon, which hung together, only 'twas full of Cracks. Our Author tells us Mr. *Houghton* try'd Fuller's Earth alſo, which left a thick Settlement, and when dry would eaſily break to Powder; but he could find no Sand in it neither by the microſcope, nor by any Grittineſs by rubbing it 'twixt his Fingers.

Having given us an account of the way of ordering of Meadows, Paſtures and Arable Land; with ſeveral ſorts of Improvements of them; our Author proceeds in his Fourth Book to give an account of the ſeveral ways us'd to improve Land by Manure, Dung, *&c.* and what is beſt for each ſort of Soil. And then proceeds farther in the Fifth to treat of the ſeveral ſorts of Corn, Grain, *&c.* and to ſhew the way and manner of ordering of them, giving an account what Soil is beſt for each ſort, *&c.* In the Thraſhing and Cleanſing of Corn, our Author wiſhes that ſome better Methods were found out than are now commonly practis'd: And as to thoſe ways that are now in uſe for the Cleanſing of Corn he thinks that in moſt places the worſt prevails moſt; for as this is commonly done either by

a Wicker-fan or one with Sails, our Author is ſatisfied that one Man with a Caſting Shovel, which is uſed but in few places, will Cleanſe as much Corn in a Day, as four Men with either the Wicker or Sail-fan. Our Author is particular in this Fifth Book on the ways of ordering the Hemp and Flax, Rape and Cole Seeds, Turneps, Madder, Woad, Weld or Dyer's-Weed, Liquorice, Safforn, Hops, *French* Furze, Carrotts, Teaſils, Caraway and Coriander-Seeds, and Ani-Seed; making ſeveral remarks on each Kind, and obſerving what Soil they thrive beſt in. I cannot be particular in what he offers upon any of theſe Subjects, but ſhall only take notice of one thing from him under the Head of Carrotts, where he tells us that he heard of a Man in *Eſſex* that had an old Orchard of about an Acre of Ground that was very Rich Mould, who ſtubb'd up all the Trees and Dug it up, and Sow'd it with Carrotts which he let run to Seed, and had of it Ten Hundred Weight, which he ſold that Year for 10 Pounds *per* Hundred.

In his Sixth Book our Author Treats of the ſeveral ſorts of Beaſts, Fowls and Inſects, proper for the Stocking of Land: And here he obſerves firſt in General, that the common reckoning for the Stocking of a Farm is three Years Rent, ſo that 300 Pounds will ſtock a Farm of 100 Pounds *per Annum*. He proceeds next to treat of the Breeding of Horſes, Cows, Aſſes, Mules, Sheep, Goats, Swine, Rabbets, Dogs, Fowls, *&c.* and gives us ſeveral Approv'd Receipts for the Cure of what Maladies the principal of them are expos'd to. He is large upon the Management of Bees and Silk worms; and concludes with a Chapter upon Fiſh-ponds, which he obſerves are a very Good Improvement of Watering Boggy Lands, and of great uſe in Bottoms between riſing Grounds, not only for the ſake of the Fiſh, but for their uſefulneſs in Watering of Cattle, and for the Benefit that there is of ſtopping the Floods that fall from the Up-lands in them, ſo as to cauſe the Waſhings of the Dung to ſettle at their Bottoms; there being nothing that is a greater Improvement of Sandy or Gravelly Land than Mud, produc'd by the Waſhings of the upper Grounds. In this Seventh Book our Author Treats of ſeveral things that are injurious to the Husbandman, and ſhews him how to prevent the prejudice that may accrue by them. He is particular upon Heats and Droughts, too much Wett, High-Winds, Mildews, Blight,

Blights, Smuttineſs, *&c.* with their Remedies: Upon the Cure of Lands prejudic'd by Stones, Shrubs, Furze, Broom, Fern, Thiſtles, Buſhes, Quitch-Graſs, Gooſe-Graſe, *&c.* Teaches how to deſtroy Foxes, Badgers, Otters, Conys, Hares, Pole-Cats, Mice, Rats, Kites, Hawkes, and all other ſorts of Vermin. For particulars upon any of theſe Subjects I muſt referr the Reader to the Book it ſelf for ſatisfaction.

The *eighth* Book contains an Account of the general Uſes of Corn, Grain, Pulſe and other Seeds, propagated by the Plough; as Wheat Barley, Malt, *&c.* And as Malt in particular is an excellent Merchandiſe, and a Commodity of great Profit to the Husbandman, our Author thinks it may be of uſe to the Farmer to know when his Malt is well made, if he does not make it himſelf. In order to this, he *firſt* gives us the common Way of making of Malt, as deſcibed by Mr. *Markham*. *Secondly*, He gives us the Way of making of Malt in *Derbyſhire*, according to the Diſcription given in Mr. *Houghton*'s Papers; and likewiſe tranſcribes the Account given by Sir *Robert Murray* in the Tranſactions of the Royal Society, of the Way of making Malt in *Scotland*; together with ſome other particular Obſervations, which he thinks may be of Advantage to the Maltſter and Farmer.

In the *ninth* Book our Author gives an Account of ſeveral Sorts of Inſtruments, Tools and Engins neceſſary for the Husbandman's Uſe: And here he obſerves in general, that it being difficult and unprofitable to make uſe of ſuch as are heavy, cumberſome and chargeable, when the ſame Work may as well be perform'd, if not better, by ſuch as are eaſie, light, and not ſo coſtly, and with leſs Labour; upon this Account he will endeavour to deſcribe ſuch as are the beſt and moſt proper for each particular Sort of Work, according to ſuch Methods and Ways as have of late been diſcover'd for its Facilitation. I ſhall give you what he ſays upon one Sort of theſe Engins for a Specimen, leaving you to conclude of the reſt from it.

It is demonſtrated by *Merſennus*, *Peter Herigon* and Dr. *Wallis* that the larger the Wheels of a Coach, Cart, *&c.* the more eaſily they may be drawn over a Stone, or any other ſuch like Obſtacle that lies in their Way: Our Author was willing to

try ſome Experimets upon this Subject to convince thoſe of the Truth of it, whoſe Heads are not calculated for a Mathematical or Mechanical Demonſtration; accordingly he order'd a Model of a Part of a Waggon to be made, conſiſting of four Wheels, two Axies, and a Board nail'd upon the Axies: The leſs Wheels were 4 ¾ Inches, and the Bigger 5 ⅝; *viz.* ½ of the ordinary Height of the Wheels of a Waggon; the Weight of the Model being almoſt a Pound and an Half. He had alſo two other Wheels made that were 5 ⅜ Inches high to put on inſtead of the leſs Wheels. The middle of the two Axies were 6 Inches and a Quarter aſunder, all the Wheels turning very eaſily upon their Axis. Being thus prepared for his Experiments, our Author laid a Piece of Lead of 50 ¼ Pounds Avoirdupois upon the Model ſo forward, that the leſs Wheels ſeem'd to bear two thirds of the Weight. Then the Model was drawn with a String laid over a Pulley, the Top whereof was one Quarter of an Inch higher than the Top of the hinder Axis, and its middle 7 ½ Inches from the middle of the fore Axis. The leſs Wheels being put on, and the String being ty'd to the Top of their Axis, the Experiments were as follows; 1. Three Pounds drew the Model on the ſmooth Table. 2. Twenty drew the leſs Wheels over a ſquare Rod one Quarter of an Inch thick. 3. Thirty Pounds drew them over a round Rod a little more than half an Inch thick. 4. Thirty One Pounds drew them over a ſquare Rod half an Inch thick. 5. Twelve Ponnds drew the hinder Wheels over the bigger ſquare Rod, the String being laid under the Axis ⅛ of an Inch lower than before. 6. Twenty Nine Pounds drew the leſs Wheels over the bigger Rod. Then the two bigger Wheels being put on inſtead of the leſs, and the String lying over the Axis. 7. Three Pounds drew the the Model on the Table. 8. Twenty Five Pounds drew the fore Wheels over the round Rod. 9. Twenty Five Pounds drew them over the bigger ſquare Rod. 10. The String lying under the Axis, Sixteen Pounds drew them over the leaſt Rod. 11. Twenty Three Pounds drew them over the round Rod. 12. Twenty Three Pounds drew them over the bigger ſquare Rod. 13. Thirteen Pounds drew the hinder Wheels over the bigger ſquare Rod. 14. A Table two Foot and an half long was ſet with one End 80 ½ Inches higher than the other, and the Model being loaded as before, leſs weight by ſix Ounces drew it up the Table when the

the four bigger Wheels were on, than when the two bigger and the two leſs were on. Theſe Experiments, our Author tells us, were try'd twice at the leaſt, and moſt of them three or four Times over. In all of them he laid the Lead exactly upon the ſame Part of the Board, but when the leſſer Wheels were taken off, the Lead did not lean ſo much forward, ſo that the hinder Wheels were ſomewhat more preſs'd than before. By comparing the Second, Third and Fourth of theſe Experiments with the Tenth, Eleventh and Twelveth, our Author obſerves, how much more eaſily a Waggon, *&c.* may be drawn in rough Ways if the fore Wheels are as high as the hinder Wheels, than if they are made after the common Way. He has ſome Obſervations upon this Occaſion, for which the Book it ſelf muſt be conſulted. In the latter End of the Chapter, in which we have theſe Experiments, our Author tells us, That he heard of a Gentleman in *Wales*, who having a Coal-pit near the Sea, from which to the Water-ſide is a plain Deſcent all the Way, loads his Coals in Waggons, for the Wheels of which he had made Groves or Channels to run in, by which and the Help of Sails the Wind carries them loaded to his Wharf; and being unloaded, one Horſe draws them up to the Hill again.

In his *tenth* Book, our Author treats of Building and Repairs, gives us a Scheme of the Proportion of Timber for ordinary Buildings: Treats of Carpenter's, Bricklayer's and Plaiſterer's Work; and the Prices, Coſt and Charges of ſeveral Sorts of Buildings, of Mills, of the Charges and Profit of Farming, *&c.*

In the *Eleventh*, Of raiſing, planting and propagating all Sorts of Timber, and other Trees uſeful either in Building or mechanic Uſes: Upon this Head he obſerves, That when we conſider that Trade, Riches and Strength are inſeparable, and that their great Dependance is upon our Navy, we might have hop'd, that ſo great a Concern to the Nation, ſhould have occaſion'd a greater Care in propagating and preſerving of Timber than has hitherto been taken; for the Propagation of which, he does not recom mend the waiting of a ſpontaneous Product, except where the Ground is full of Roots and young Wood, becauſe of the Length of Time that ſuch a Production

requires, and becauſe that neither Planting nor Sowing are any hindrance to it; neither does he determine in this Place, which is the beſt Way of raiſing of Trees, by Seed, or by the Tranſplantation of ſuch as we find to have rais'd themſelves from the Seed, or that ſpring from the Mother-roots of other Trees; becauſe he takes Occaſion to inſiſt upon theſe Matters afterwards, and in the Sequel of his Diſcourſe to give an Account of ſeveral particular Experiments relating to each ſeveral Way: He begins his Diſcourſe upon this Subject with the raiſing of Trees by Seed, as being what muſt of Neceſſity be the firſt Work in moſt Places, becauſe other Trees are not to be had to make Plantations with: And treats of the Soil, Seeds, Seminaries and Nurſeries; and then deſcends to particular Trees, ſhewing how they are rais'd, what Time is beſt to remove them in, in what Soil they thrive beſt, what are their Uſes. Thus he treats of the Oak, the Elm, the Aſh, the Beech, the Cheſnut, the Walnut, the Mulbery Tree, the Serviſe Tree, the Maple, the Sycamore, the Horn-beam, the Lime Tree, the Quick-beam, the Birch, the Hazel, the Poplar, Aſpen and Abel, the Alder, the Withy, Sallow, Ozier and Willow, the Firr and Pine, the Larch, Platanus, Lotus and Cornel Trees, the Cypreſs, the Cedar, *&c.* I can't be particular in the Account of what he offers any of theſe Subjects, but muſt refer the Reader for Satisfaction to the Book it ſelf.

In his Twelfth Book our Author Treats of Coppices and Under-wood, of the Tranſplantation of Trees, of the Planting of Avenues, Walks, *&c.* of the Planting of Trees in Hedges, of the Infirmities of Trees with their proper Remedies, of Pruneing Foreſt-Trees, of the Age and Stature of Trees, of the Felling of Trees: Under this laſt Head our Author gives the Rules for meaſuring of Timber, and one Table of Girt and Square meaſure, whereby we may ſee the Contents of any piece of Timber, according to the common way of meaſuring from half an Inch Square to 36 Inches, and in length from one Foot to 30; another Table to ſhew how much in length will make a Solid Foot of any Tree whoſe quarter part of the Circumference is from ſix to 36 Inches; he gives us another Table whereby to meaſure Plank, Board, *&c.* a Table of Square meaſure, whereby he ſhews how much goes to make a Solid Foot of any piece of Timber from an Inch to 30 Inches Square: length

and a Table of round meaſure, which ſhews how much in length makes a Solid Foot of Timber in any round Piece whoſe Diameter is from an Inch to 30 Inches over. He proceeds after this to treat of the Grubbing up of Wood and Trees, of the Seaſoning of Timber, of the preſerving of it; under which Head among other particulars he tells us, that it is worth while to take notice of the Practice of the *Hollanders*, who for the preſervation of their Gates, Portcullises, Draw-Bridges, Sluces and other Timbers expoſed to the perpetual Injuries of the Weather, Coat them over with a mixture of Bitch and Tar, upon which they ſtrew Cockle and other Shells beaten almoſt to Powder and mingled with Sea-Sand, which Incruſts and Arms it after an incredible manner againſt all the Aſſaults of Wind and Weather. Our Author concludes this Book with a method of Cloſing Chops and Clefts in Green-Timber, and with conſidering, and in ſome meaſure propoſing of Remedies for two of the greateſt Diſcouragements that belong to the Planting and Raiſing of Foreſt-Trees; the one, the long time that the owners are forc'd to wait for the Growth of their Timber before they can make any Profit of it; and the other, the Timber's being liable to ſo many Abuſes and Cheats from Tenants, Baliffs, Executors and others, in caſe of the Owner's Negligence or Death; eſpecially if they are forc'd to leave their Wood to a Young Heir. The Reader muſt have Recourſe for a large Anſwer to theſe Objections to the Book it ſelf.

The Thirteenth Book contains an Account of ſuch Herbs, Roots and Fruits, as are uſually Planted in the Kitchin-Gardens; before our Author comes to which, he ſays ſomething of their Situation, for which he tells us ſmall Valleys or low Grounds are beſt; eſpecially if they are not expoſed to Inundations, and afford good Water, *&c.* The beſt Figure for a Kitchin-Garden and moſt convenient for Culture, he makes a Square of Right Angles ſuch as he calls a Parallelogram once and a half or twice as long as broad. He ſpeaks farther of the way of Ordering of Land for the Kitchin-Garden, of the laying out of the Borders, making of Hot-Beds, and of ſeveral other matters thereunto relating; of Watering in particular, and more eſpecially of Watering with a Liſt by way of Filtration. As to the Herbs, Roots and Fruits, he gives us them in an Alphabetical Order; and afterwards, before he proceds

proceeds to a Deſcription of the Orchard and Fruit-Trees, he takes notice of ſeveral ſorts of Flower-Trees, Winter-Greens, and other Shrubs that will bear the Froſt, which are both convenient and Ornamental for the making of Hedges, Walks and the Partitions of the ſeveral Quarters of Gardens, Orchards, *&c.* of theſe he Treats Alphabetically, as of the Acacia Alaternus, Almonſdwarf, Althæa Fruticaſa, Arbutus, Bucks-Horn-Tree, Bays, Celaſtrus, Jeſſamin, Laurus Tinus, *&c.*

The Fourteenth Book is upon the Subject of Fruit-Trees; the Advantage of which our Author tells us appears *Firſt*, in this, That there is ſcarce any ſort of Soil but one ſort of Fruit-Tree or other may be raiſed on it if it is Judiciouſly manag'd. *Secondly*, In the uſe of Fruit, which is univerſally Good, both for Eating and Drinking, there being hardly any places where of late Years Fruit is not much made uſe of, eſpecially the Juice for Cyder; which being made of Good Fruit and Well prepar'd is a moſt delicious and wholeſome Liquor, and moſt Natural to our *Engliſh* Bodies; there being no Country in *England* that hath afforded longer liv'd People than the Cyder Countries: *Thirdly*, In the Charges and Expences about Fruit-Trees, which are very ſmall, eſpecially if compar'd with thoſe of other ſorts of Husbandry; there being hardly any more requir'd than the trouble of gathering the Fruit, after a few Years at firſt, which is an inconſiderable Charge to the Profit and Advantage that accrues to the owner afterwards. Upon this Subject our Author Treats of the Seminary and Nurſery for Fruit-Trees; of the Grafting of Trees; of Dwarf, Wall and Standard-Trees; of the manner of Cultivating Ground for an Orchard; of the Tranſplanting of Trees; he gives us a Catalogue of Fruits, as Apples, Pears, Cherries, Plums, Apricots, Peaches, Malacotunes, and Nectarines, Quinces, *&c.* He afterwards proceeds to treat of the Pruning of Trees, and of ſome neceſſary Obſervations about Fruit-Trees: Of the Vine; and here he ſays that the beſt Method he has met with to make *Engliſh* Wine is, after the Grapes are pick'd from the Stalks to preſs them, and to let the Juice ſtand 24 Hours in the Fatt, then to draw it of from the Groſs Lees and put it in a Cask; and to every Gallon of Juice to add a Pint or a Qurt of ſtrong Red or White *Port*, according as you deſire it in ſtrength:

This

This he orders to be let Work together, and afterwards to Bung it up close, and let it stand till *January*, at which time in dry Weather he orders it to be Bottl'd. This way, he says, he has made as good Wine as any *French* without Adulteration; which consisting of four parts of our own Product and but one of Foreign, must be of advantage for the Promotion of our own Grapes. He concludes this Book with a Chapter upon the Gathering of Fruit, and their Preservation when gather'd, *&c.*

Having given an Account of the Way of ordering, managing and improving of Corn and Fruits in the former Parts of this Work, our Author proceeds in his *fifteenth* and last Book to endeavour the Improvement of *English* Liquors, which is a Part of Husbandry he thinks too much neglected; and therefore he gives the best Help towards it he can, and begins with *Beer* as the most common Liquor, and what for want of good Management is generally the most spoil'd of any Liquor we make. After what he says upon this Subject, he proceeds to *Syder*, and the several Ways and Methods of making it, and Mixtures with it, with the Way to make Water-Syder, and some Observations upon the Fining, Fermentation, Restoring and Bottleing of *Syder*, &c. He has a few Lines upon *Perry*, and then proceeds to treat of the Making of other Sorts of Wines or Drinks of Fruit; as Cherry-wine, Plum-wine, *&c.* He treats of the Making of Metheglin, Birch-wine, and some other Drinks or Wines usually drank in this Island. Before his concluding Calendar he gives us a Receipt to make *Mum*, as recorded in the Town house in *Brunswick*; which Drink being very wholesome, and what may be made of our own Product, he wishes it might be made a Home Commodity instead of a Foreign, for the Encouragement of which he gives us this Recept; which I can't transcribe hither, but must leave the Reader for this and innumerable more Particulars to have recourse to the Book I have been endeavouring to give him some Notion of.

Johannis

Johannis Bernoullii, *M. D.* Baſileenis *Diſſertatio de motu muſculorum*; *Or a Diſſertation on muſcular Motion, by* John Bernoulli, *M. D. of* Baſil. London, *Printed by* J. M. *and are to be Sold by* R. Smith, *at the* Bible *in the* Royal Exchage *in* Cornhill. 1708. 4*to*. *Pag*. 31.

THE Reaſon which put the Editor of this Book upon reprinting it in *England*, was this, The Excellency of the Book it ſelf compar'd with the ſmall Number of Copies printed at *Baſil*, which conſequently could come but in few Hands; and as to the Mathematical Meditations upon this Subject printed in the *Leipſick Tranſactions* for 1694. they give us, but a Part of this Work. The Editor once deſign'd to have added to this Piece ſome Things out of his own Anatomical Papers *upon the Fabrick of the muſcular Fibre*, and thought alſo to have commented ſome Things upon the Author's Demonſtration, but Buſineſs put him upon defering the Execution of theſe Deſigns at preſent; however, he encourages us to hope that he will publiſh what he has to offer upon theſe Subjects, together with ſome other Particulars relating to *the Uſe of the Parts of the Body* when he ſhall meet with a convenient Opportunity.

The Author himſelf tells us, That having long conſider'd with himſelf what Part of Man to make choice of, whoſe Functions might be beſt explain'd by the Laws of *Mechanicks*, at laſt he determ'd that which the Anatomiſts call the *Muſcle* to be moſt for his Purpoſe, both upon account of the Uſefulneſs of the Part it ſelf, and alſo by reaſon of the Evidence of Mathematical Demonſtration, and that fetch'd from the inmoſt Receſſes of Geometry, which we have for the whole *muſcular* Doctrine. It is not his Deſign in this Place to be particular upon the anatomical Deſcription of the *Muſcles*, this being to be found done already by the moſt accurate Anatomiſts of the preſent Times. But he endeavours to give us a general Idea of the Structure of the *Muſcles* ſo far as is neceſſary in order to the Explication of their Modes of Operation, and of the

the animal Motions thence reſulting. Here our Author tells us, He will follow the Foot-ſteeps of the famous *Borelli*, proceeding upon his Hypotheſis; which yet, he tells us, that great Man apply'd too looſely when he made the little conſtituent Veſſels of the *muſcular* Fibres *Rhomboidal*: Whence (ſays he) it will appear, that he prefer'd this right lin'd Figure for the Eaſe thence reſulting in the Calculation of the *Ratio* of the expanſive and reſiſting Forces, and becauſe he could not diſcover the circular Figure without the *differential Calculus*, which till Monſieur *Leibnitz*'s Time the World was not acquainted with. In the Proceſs of his Work our Author gives us a Curve, whoſe *Ordinates* denoting the Reſiſtences encreaſing by the *Minima*, the *Abſciſſe* will expreſs the Quantity of the Expence of Spirits, which *Borelli* has not ſo much as touch'd upon; and hence he takes occaſion to conſider and determine the Strength or Wearineſs of the *Muſcles* occaſion'd by the Acceſs or Expence of Spirits.

As to the Structure of a *Muſcle* moſt of the Anatomiſts, he obſerves, are agreed about it; he explains it here as ſuch an Explication is of Service in the more accurate Solution of what *Phænomena* he ſhall have occaſion to take Notice off. A *Muſcle*, according to him, being an organical Part of the Body, conſiſts of a Membrane, Fleſh, Arteries, Veins, Nerves and a Tendon. The Membrane is as a Coat to the *Muſcle*, under which you meet with innumerable Fibres ſaturated with a blood Colour: This Compages of Fibres is commonly call'd the Fleſh, which is terminated by a white Subſtance of a nervous Conſiſtency, which the Anatomiſts call a Tendon; this is found at both Ends of the *Muſcle*, and the intermediate Part is call'd it's Belly: The whole *muſcular* Subſtance is pervaded by innumerable capillary Arteries, Veins and Nerves; the Former that they may bring on and carry off that Blood which is neceſſary both for the Nouriſhment and Motion of the *Muſcles*, and the Latter for ſupplying a ſpirituous Juice, which being mix'd with the Blood cauſes that ſudden Ebullition which he afterwards enlarges upon, and which is the Vehicle of Senſation, and acquaints the Soul with whatever occures either within or without the Body.

Our Author has ſeveral other Particulars about the Fabrick of a ſimple *Muſcle*, and then proceeds to examine what is the firſt Spiring of a *muſcular* Motion: And here rejecting the na-

tural, incorporeal, motive Faculty of the Antients, he diſcards alſo *Steno*'s Hypotheſis, who in his *Specimen of Myology* will have the Motion of the *Muſcles* to be perform'd without the Acceſſion of any new Matter, by the meer Change of the Figure of the *muſcular* Priſm, from a more into a leſs oblique angled Parallelogram. This Opinion our Author looks upon as a meer ludicrous Fiction; for beſides, that this Sort of *Muſcular* Contraction can't be explain'd without admiting Penetration of Dimenſions, he looks upon it as inconceivable what is the firſt Mover of the *Muſcle*, and how the old phyſical Axiom is ſolv'd in this Caſe, That *whatever is mov'd, is mov'd by ſomething different from it ſelf*: For our Author can ſcarce conceive that the Motion of the Motion of the corporeal Machine depends immediately upon the Volition of the Soul, otherwiſe upon the Cutting or Contraction of the Nerves, he knows not what ſhould hinder *muſcular* Motion, unleſs you will have the Way of the Soul in this Caſe to be cut off or intercepted, through which ſhe us'd to march from the middle of the Brain to the exterior Parts of the Body, there to execute her Commands; but this, he ſays, were to conceive of the Soul after too corporeal a Manner. Many other Arguments there are, ſays our Author, deſtructive of *Steno*'s Hypotheſis, for which he ſends his Reader to *Borelli* and *Mayow*. What he thinks the true Cauſe of *Muſcular* Contraction is this, That it ariſes from a certain Diſtention of the Parts: Of this Opinion, he tells us, are *Willis* and the Authors now cited, who all agree in this, That there is an Ebullition in the *Muſcles* which ſo ſtretches the Fibres, as that what they looſe in Length they gain in Breath.

With theſe our Author agrees in general, and lays it down with *Borelli*, That the Nerves are a Congeries of little Tubs fill'd with a certain ſpungy Subſtance, which always ſwells and is full of a certain very ſpirituous Juice, with which it is furniſh'd from the Brain, of ſuch a Nature that it is no ſooner mix'd with the Blood but it is immediately fermented. This Juice he makes the ſame with what vulgarly goes under the Name of the *Animal Spirits*. And when ever the Soul exerciſes an Act of Volition, he concludes from the admirable Union of the Soul and Body, that there is a certain local Agitation of the Spirits in the Brain, or of this ſpirituous Subſtance, which vellicating the Beginning of a Nerve moves the

Juice

Juice it is impregnated with from End to End; as in the Caſe of a Staff, one End ofwhich cannot be mov'd but the other moves along with it, by reaſon of the Contiguity of its Parts: And thus one End of a Nerve being ſtir'd, this Concuſſion throws the laſt Drop of the nervous Juice out of the other End; and the ſame happens upon the ſame Act of Volition to all the Reſt of the Nerves however diſpers'd thro' the ſame *Muſcle*. And he obſerves farther, That whereas in this Hypotheſis the Ends of theſe Nerves are always open, yet the Drops of the nervous Juice fall not out without Concuſſion, becauſe the ſpungy Subſtance of the Nerves ſerves to detain them inſtead of Valvulæ; as common Spunge does the ſame if unſhaken.

Our Author proceeds to obſerve, That when upon any Act of Volition, *&c* innumerable Drops are thrown out of the Orifices of the Nerves, after the that Way he has been ſpeaking of, through the whole Maſs of the *Muſcle*, which is otherwiſe always like a Spunge moſten'd with Blood: then their ſpirituous Particles ſtriking with their inconceivable fine Points upon the Particles of Blood, ſhatter them to Pieces, and let out the Air which was lodg'd in them; which expanding it ſelf, makes an Ebullition, and cauſes the ſubſequent Swelling of the *Muſcles*. As to what may be objected againſt what our Author offers here, *viz.* How can it come to paſs, that after this momentaneous Ebullition the *Muſcle* ſhould immediately return to its former State, which ſeems contrary to his own Principles laid down in his Diſcourſe of *Fermentation*? In order to anſwer this, he aſſumes, that beſides the common Air which we breath there is another Sort much more ſubtile and fine, which, notwithſtanding its great Elaſticity, is utterly imperceptable as freely penetrating all the Pores of the Body: The Reaſonableneſs of this Hypotheſis he builds upon this, That there muſt be Matter aſcending gradually in Fineneſs of Conſiſtency betwixt the common groſs Air and the infinitely fine etheral Matter, leſt there be an *Hiatus* in Nature; this Matter (he ſays) muſt neceſſarily be Elaſtick for the ſame Reaſon that common atmoſphærical Air is, by Reaſon of the continual Motion of the ethereal Matter which always endeavours to ſhatter and break in Pieces all Particles more groſs and in leſs Agitation than it ſelf: This Sort of fine elaſtick Air, he ſuppoſes Latent in the minuteſt Cells and Pores of all Bodies; and upon this

Suppoſition he anſwers the Difficulty propos'd, by ſaying, that the little Particles of the ſpirituous Juice of the Nerves breaking the fineſt Particles of the Blood in the *Muſcles*, open their little Pores, and let out the ſubtile elaſtick Air which lay condenſed in them, which being at Liberty expands it ſelf and ſwells the *Muſcle* at its firſt Eruption, but immediately, by reaſon of the innifite Fineneſs, breaks freely through the Pores of the *Muſcle*, and flies off into the open Air: Hence it comes to paſs, ſays he, that after the Ebullition the *Muſcle* returns immediately to it former State; unleſs new Drops of the nervous Juice fall into it every Moment, which cauſing new Ebullitions inſtantaneouſly following one another, keep the *Muſcle* conſtantly expanded.

Upon this Occaſion our Auther obſerves, that in ſo great a Quantity of nervous Juice as is in an human Body, there muſt be ſome ſtronger pointed Particles than others which open the greater Pores of the Blood, whence may iſſué groſſer Air, which being not able to penetrate the Pores of the *Muſcle*, and Skin may collect into little Air-bladders, which are ſomewhere met with as large as a Pea: From hence our Author deduces the Reaſon of the Tympany or dry Dropſey. He obſerves farther, That on the Contrary ſometimes the Points of the animal Spirits may be too ſoft, ſo as to be unable to enter the *muſcular* Blood, whence the Ebullition in the *Muſcles* will be diminiſh'd, and ſometimes totally ceaſe; this he looks upon as the Reaſon of the Palſey. And here he ſays, That it is a vulgar Error amongſt the Phyſitians to think that the Palſey proceeds only from a Stoppage of the Courſe of the animal Spirits, which ſometimes is not at all true, as is evident from hence, that in the Palſey Sentation is not weaken'd, which ought to be were this the Cauſe of this Diſtemper. Our Auther therefore takes the true Cauſe of the Palſey to be ſometimes the Diminiſhing or total Ceſſation of Ebullition in the *Muſcles*, which happens when either the ſpirituous Juice in the Nerves, in whatever Quantity it flows into the *Muſcles*, has loſt its pungent Quality, and can't cut the Particles of Blood; or when the Blood is ſo viſcous that they can't enter it, however pungent in themſelves they may happen to be.

By

By this Hypotheſis, our Author tells us, he could eaſily explain all other Symptoms relating to the Motion of the *Muſcles*, as ſpaſmodick or convulſive Motions, the Stiffneſs and Trembling of the Joints, *&c.* but this is beyond his Deſign, which is only to ſearch accurately into the natural Phænomena of animal Motion. In order to which, he obſerves, that the Fibres that move the *Muſcles* are faſten'd together tranſverſely by other little Fibres, ſo that they become inſtead of little hollow Cylinders, a Parcel of *Catenulæ* of Bodies approaching to a globular Figure, and not *Rhomboidal* as *Borelli* ſuppoſes. This Figure of each of theſe *Tubuli*, our Author firſt proves from the Nature of the Preſſure of Fluids, which being always to preſs according to a Perpendicular, to the Curve they preſs upon, and as the Air's Elaſticity is equal every Way; as hence it muſt follow, that the Fibre of the muſcular Machin, which is ſuppos'd to be abſolutely flexible is every where forc'd outwards with the ſame Strength, ſo no reaſon can be aſſign'd why one Point of the Curve ſhould be more or leſs diſtant from its Center than another. After this, our Author inveſtigates this ſame Curve by a *differential Calculus*: And then proceeds to calculate the *Ratio* betwixt the expanſive and reſiſting Forces, *&c.* And after ſeveral very curious intervening Particular, which I can't take Notice of here, becauſe they depend upon and refer to Schemes, he proves againſt Mr. *Boyle*, that in Air very much condenſed the Elaſticities encreaſe in a much greater *Ratio* than the Denſities; the Elaſticities becoming infinite when the Denſities are come to their higheſt Degree, which is yet but finite. This he applies to the Buſineſs of *Muſcular* Motion; and proceeds to what he calls a Profitable and leſs pleaſant Speculation, *viz.* In what *Ratio* the Degrees of Strength and Wearineſs are to be eſtimated. What he ſays upon theſe and all other Subjects he meddles with, in what the Editor rightly calls his golden little Piece, I have not Room enough to inſiſt upon farther here, but muſt leave the Reader, who is vers'd in Matter of this curious Nature, to conſult the Book it ſelf for his own Satisfaction.

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